POPULAR Computing WEEKLY

Only 50p.

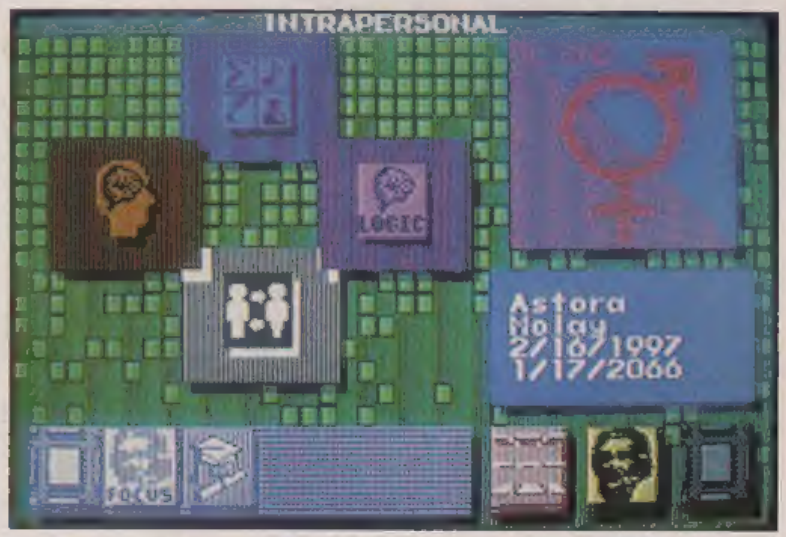
29 January–4 February 1987 Vol 6 No 5

SPECIAL supplement

Beginners' Guide to Computing Part three

Basic graphics
Communications

Commodore's new Amiga A500 Picture inside



REVIEWS

Activision's Portal – the computer novel

Icon Graphix 128: extended Spectrum art

NEWS DESK

Mastertronic's Ninja Mission – on the ST for under £10

Commodore's plans for 8-bit range

RAID 2000

FOUR HYPO JETS
FOUR PILOTS
ONE COMMANDER
900,000 ALIENS
BILLIONS OF PEOPLE
MUST BE SAVED!

OUT IN FEBRUARY
FOR COMMODORE 64/128
£9.95 Tape/£12.95 Disk

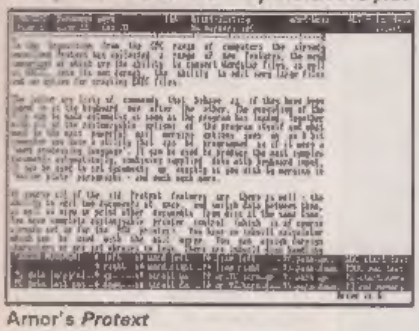
MIRRORSoft

Maxwell House, 74 Worship Street, London EC2A 2EN
Tel: 01-377 4645

29 January–4 February Contents

HARDWARE▶

13 MP 200 printer
MicroPeripherals' 200 cps dot matrix printer reviewed by Keith Hoyle.



Arnor's *Protext*

◀SOFTWARE

14 Protext
Arnor's amalgamated *Protext, Promerge* and *Prospell* programs, now available for the Amstrad PCWs.

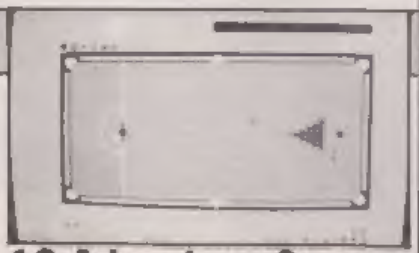
14 Plan-it
Get your life into some sort of order with Database Software's new personal management package.

15 Icon Graphix 128
Audiogenic's Spectrum graphics program has been extended and enhanced for the Spectrum 128/Plus 2. Chris Jenkins reports.

GAMES▶

16 Arcade Action
Includes this week's Gallup Top Twenty.

17 Reviews
Activision's three part interactive adventure *Portal*, Software Projects' sequel to *Dragon's Lair* and Pyramide's 3D game *Wanderer* (special glasses supplied) are among the titles put to the reviewers' test.



18 Adventure Corner
Tony Bridge casts his mystical eye over the first two titles in Incentive's Medallion series – adventures written using *GAC*.

SPECIAL SUPPLEMENT

Beginners' Guide to Computing

Part three of our four-part series on finding your way around your micro.

21 Computer Graphics
An introduction to using graphics in your programs.

24 Communications
Get into networking and turn computing into a social pursuit.

All you need to know to get started in the world of communications.

28 Introduction to Basic, Part Three
In this, the final part of our guide to Basic, we show you how to put all the information and routines published so far into your own programs.

◀PROGRAMMING

29 Spectrum
Replay Sunday's Superbowl final to your heart's content – it's the second part of Duncan Evans' American Football game.

30 Memotech
Expand your characters – courtesy of Eric Roy.

31 Commodore 64
Ideas with sprites from John Consadine.

32 Amstrad CPCs
A simple code converter from Simon T Goodwin.

34 Bytes and Pieces
35 Peek and Poke

REGULARS▶

4 News Desk
10 Letters, Puzzle
11 Chess Tournament

36 Soundcheck
Mark Jenkins has the latest developments on the Spectrum scene.

38 Communications
Keeping costs down – how to avoid those astronomic phone bills.

44 New Releases
46 Ziggurat, Hackers

Editor Christina Erskine **News editor** John Lettice **Features editor** John Cook **Technical editor** Duncan Evans **Production editor** Michelle Beauchamp **Supplements editor** Christopher Jenkins **Supplements designer** Barbora Hajek **Advertisement and Promotions manager** Simon Langston **Assistant advertisement manager** David Osen **Advertisement executives** Jon Beales, Rodney Woodley **Classified executive** Susannah King **Editorial secretary** Annmarie O'Dwyer **Administration** Geraldine Smyth **Managing editor** Peter Worlock **Publishing director** Jenny Ireland. **Published by** Sunshine Publications Ltd, 12–13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Fax 01-439 0681 **Typeset by** Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire. **Printed by** McCorquodale Magazines, Andover, Hampshire. **Distributed by** S M Distribution, London SW9, Tel 01-274 8611, Telex 261643.

© Sunshine Publications Ltd 1987.

ISSN 0265-0509

Popular Computing Weekly. Tel: 01-437 4343.

ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

Amiga 500 – see for yourself

THE picture (left) shows Commodore's Amiga A500 machine, previewed privately, along with the A2000, at the CES show in Las Vegas earlier this month.

The 512K A500 with built-in 3½ inch disc drive will sell in the US at $599 (£428) – see News Desk, January 22 – and will almost certainly be priced competitively with Atari's entry level ST machines in the UK.

Commodore is keeping quiet about UK launch dates for the machines. A spokesman for the company said, "There will inevitably be extensions to the Amiga, and certainly this year, but there are no firm plans."

C128 offers in the air

MOVES are afoot at Commodore UK and its main distributor to reposition its older range of machines for 1987.

Commodore UK's marketing manager, Mike Clarke, hinted that the C128 machine, which has had little publicity in recent months, may be the subject of a promotion this year.

"It's probably true that the 64C Compendium is a more attractive buy right now, but that pack will be replaced in the spring. Spring would be a good time to do something with the 128 – we're always looking to take the initiative and make things happen."

Commodore's distributor, Zappo, has recently started a promotion with the C128D in which the machine is sold with a free Philips green screen monitor and £50 off Precision Software's *Superbase* and *Superscript* programs. "Sales have boomed. It's transformed what has been something of a Cinderella product," said Don Carter of Zappo.

Mastertronic set to release 16-bit Ninjas

Ninja Mission on Atari ST

MASTERTRONIC is ready to release its first budget Atari ST and PC compatible game next week. *Ninja Mission* is, as its name suggests, a martial arts combat game. Developed in the US, it will retail at £9.95 in the UK on both ST and IBM formats.

Further 16-bit machine releases from Mastertronic include *Pro Golf* and *5-a-Side Soccer*, also originated in the US.

While the price is exceptionally cheap for 16-bit games, Tynesoft also has a range of ST products for under £10.

Plastic menus

MENU Mate is an accessory for the Amstrad PCW machines produced by Richman Software.

Menu Mate is a plastic sheet which fits over the PCW keyboard. Overwritten on the transparent plastic are various details listing, for example, actual size reproductions of pitch widths and an explanation of the copy, cut and pasting procedure.

Richman claims that it is more convenient than referring to a book or manual.

Menu Mate costs £6.99 from Richman at 14–16 Little Walk, Harlow, Essex.

Sparklers explode up-market

BUDGET software publisher Creative Sparks is to launch a full-price label later this year.

Called Status Software, the new division will publish software for machines from the Spectrum to the IBM PC and compatibles, using both in-house and contracted programmers.

The first titles will be *The Vikings*, a scrolling arcade game licensed from Denmark, to be released for the Commodore 64 and Spectrum at £9.95 on tape (£14.95, Commodore disc).

Two PC-compatible games will follow, *Icon Quest for the Ring* and *Fortune Teller*, both licensed from the US.

While these will sell for a budget price (for PCs) at £14.95, CSD felt that Status was a more appropriate label than Sparklers for PC products.

Status will not, however, produce any games originated by MikroGen, the company which it bought at the end of last year. "MikroGen will operate as an entirely separate entity," said CSD's publishing manager Leigh Richards.

Public domain libraries under threat in UK

THE distribution of public domain software in the UK has taken a jolt with the arrival of American company International Software Distributors (ISD) into the country.

ISD sells the large PC-Sig library – public domain games, utilities and business programs for the IBM PC and compatibles, comprising around 600 discs, with a number of programs per disc.

In the UK, two user groups, PD-Sig and Compulink, have been distributing PC-Sig software in the UK for some years now. Both have recently been sent solicitor's letters from ISD claiming infringement of PC-Sig's copyright.

With public domain software, the copyright rests with the program authors, who then grant permission for the software to be freely copied and distributed, without royalties being paid to the author (in this way, public domain software is distinct from 'shareware', where users are expected to pay the author – if they are satisfied with the program).

Different order

ISD is not claiming copyright on the individual programs held within the PC-Sig library, but on the PC-Sig cataloguing and numbering system, and documentation.

Ian Philipps, of PD-Sig, commented, "We have now produced our own library, utilising vast quantities of the software in a different order, at the lawyer's request. We've had no communication from ISD since, so I presume it's all cleared up."

However, Frank Thornley, head of Compulink, does not accept ISD's claims. "We acknowledge its copyright on PC-Sig's catalogue, but we dispute its claim on the numbering system. It's virtually the same as copyrighting the numbers 0–9.

"Basically we're sitting back and letting them get on with it. We don't distribute PC-Sig discs, we distribute 100% compatible discs. We've removed any mention of PC-Sig from the discs.

"We're not paying any attention and if they pursue us any further, we'll retaliate."

No doubt

Rita Wolfe, who heads ISD's newly set-up UK division, based in Sutton Coldfield, says there is no doubt about claims to copyright. "We're not talking about rights to PD software, but to the cataloguing – the numbering system, the write-ups, making sure there are no bugs. To copy a library from 1–500 is illegal. Compulink is taking the work wholesale that PC-Sig has built up over six years."

One feature of this dispute which rankles with both PD-Sig and Compulink is that ISD aims to be run as a commercial concern, although the original aim of public domain software was that it should be available either free, or at a nominal charge to cover basic costs. Both PD-Sig and Compulink say they are non-profit making organisations.

ISD charges £10 for a single disc volume of titles, while both PD-Sig and Compulink say they only charge enough to cover costs.

Rita Wolfe said, "Yes, we do aim to make a profit – it costs a lot to get this going and working. To say you're non-profit making is ridiculous – you might as well work hard and make it grow.

"Our prices will probably be going down soon anyway. We're setting up in Europe, so we won't have such high import costs."

More news on pages 6 and 8

Software Hotlines

School's out at Grange Hill

English Software is well known for being short on hype, long on quality – yet doesn't seem to have had that huge mega-hit that will put it well and truly into the software First Division. Maybe *Leviathan* will change things for the company.

Leviathan (see below) is a graphically and technically impressive shoot 'em up that should appeal to anyone who enjoys a good blast.

English, headed up by Philip Morris, wanted to produce a two-way diagonal scroller with an emphasis on the manoeuvrability of the ship – as well as the obligatory zapping. Judging by the way the thing almost turns inside out as it weaves its way across the colourful screens, the company has succeeded.

Much of the programming was done by the Binary Design team, which is certainly putting itself around. As well as producing games for **Mastertronic** (includ *Feud*, its first **Bulldog** title . . . it's called **Bulldog,** incidentally, because produce will be released in a constant dribble) it got roped in to do *Grange Hill* for **Argus Press Software.**

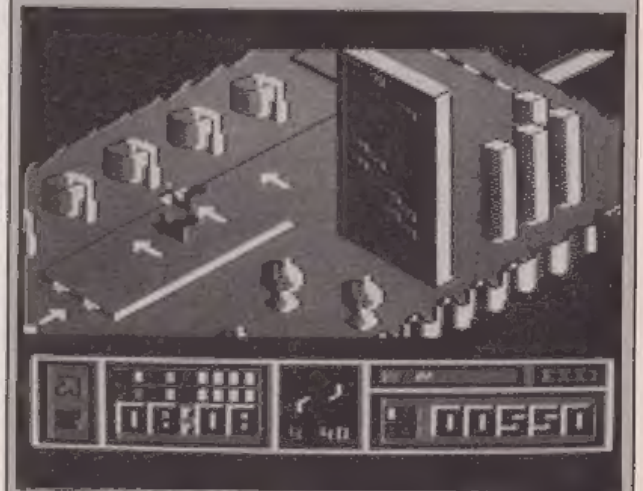
Combined with the fact that the game has been designed by Colin Jones, this means it has a chance of being a decent game, despite the naff tie-in. The plot has you returning to school after hours to retrieve your Walkie from the Staffroom, as it's been confiscated by an uncool teacher. Look out for a review soon.

Other **Argus** up and coming releases include *Agent Orange* (classy shoot 'em-up) and *Wibstars* (Mario Brothers meets Micro Dealer). **Lothlorien** will be releasing three titles that sound good, *Circus Maximum* (chariot racing), *Roundheads* (English Civil War stuff) and *World War One* which will be using that great 'cartographic' map display system, first used in *Legions of Death*.

There are also plans for a book tie-in from **Argus,** called *The Hunt for Red October*, based on the book by Tom Clancy. Best of luck, but book tie-ins don't seem to have done that well in the past.

The Fourth Protocol probably did best, soon to be a movie staring that lovable fact merchant Michael Caine. And now **Ariolasoft** will be bringing out Amstrad PCW, PC and Apple II versions of the game. Not a lot of people know that . . .

John Cook



Leviathan on Commodore 64

Micro games of the future at arcades exhibition?

THERE were few surprises on the arcade machines front at the Amusement Trades Exhibition International at Olympia last week. But amidst the cacophony of fairground rides, bingo machines and one-armed bandits there were one or two interesting attractions.

Star of the show was undoubtedly Konami's *WEC Le Mans* simulator, the fully dynamic racing game first seen in Tokyo in October. It looks like the kiddie rides found outside supermarkets, but its action is anything but juvenile as it twists and turns, even vibrating if you run off the road.

Meanwhile the on-screen landscape turns from day to night, then back to day. A spokesman for Konami said that he could see no reason why it couldn't be converted for home micros – though obviously that would lose the dynamics.

Konami was also showing *Rock and Rage*, a two player combat game where you hit the baddies with your guitar, and *Gryzor*, also two player, which arms you with more traditional weapons like machine guns.

Atari's *720°*

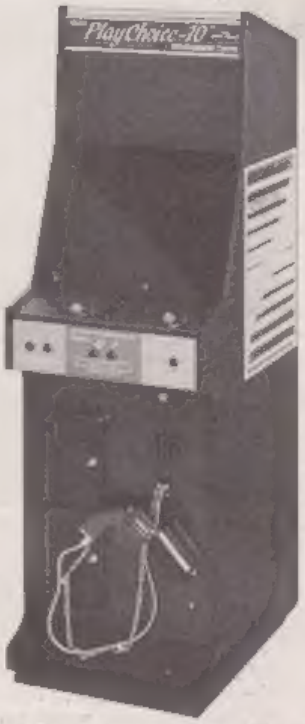
On the Atari stand there was "The Ultimate Aerial Experience!" No, not a flight simulator but a skateboard game called *720°* with various landscapes, such as ramps, jumps and slaloms. This uses a new controller to help with those tricky manoeuvres, speech and the arcade operator's favourite, an add-a-coin facility.

On the same stand Namco's *Rolling Thunder*, "for game freak" as the Japanese publicity sheet tells you, sets you against the evil Maboo, leader of Gledra, in the New York City of 1960. Not that the locals seems to matter much as it's mostly set indoors.

Still, there's lots of jumping over railings and shooting, so go for it, game freak.

Atari will also be handling the Seeburg Compact Disc jukebox in Europe. It was unable to say whether any of their new games will be converted for the home, but did reveal that there had been some enquiries. Representatives of many major software houses were attending the show.

Brent Leisure was demonstrating the *Play Choice-10* machine from Nintendo. It's the arcade equivalent of the compendium tapes, allowing you to play a variety of games until your money runs out. The real interest lies in its circuits; they record the popularity of individual titles, letting the owner change them at will!



My favourite machine wasn't a video game at all though. Doron's SR2 is actually quite a veteran. It's a huge, hydraulic cannister, mounted on hydraulic legs, rather like a professional flight simulator. The audience is shown films of big dippers or bobsleigh rides while a custom-built computer tosses them round and operates effects inside. Not one for the home, alas – unless some clever reader can find a way of interfacing a micro to a rickety, old typists' chair!

John Minson

Legal aid

LEGAL advice is now available electronically from London solicitors Pennefather and Co.

The network being used is Microlink, and to introduce the new legal service, Microlink subscribers are entitled to one free reply to any legal query they care to put to the company.

Details from Microlink on 061-483 2737.

BMX competition

CODE Masters, the company founded late last year by ex-Mastertronic programmers Richard and David Darling, is giving away a 20 inch Sony Trinitron TV in a competition based on its *BMX Simulator* game.

Entry forms are available from stockists of *BMX Simulator* and depict a screen shot from the game with one of the characters missing. Entrants must guess where the character should be on the screen. Proof of purchase of Code Masters games is required to enter, and the competition is open until the end of March.

Apple increases revenue

APPLE Computer has announced sales of $662.3 million (£435.7m) for the financial quarter ending in December 1986. This is 24% up on the same period for 1985.

Apple's chairman John Sculley, speaking for the US market, commented that the "new Apple IIGS has been well received and our Macintosh products continue to achieve record sales levels."

For the UK side of the company, MD David Hancock noted that the figures "parallel our success in the UK market, where we have seen strong growth in Macintosh Plus sales, as well as the launch of the Apple IIGS."

Kuma enters Atari ST business territory

KUMA Computers, which has produced a number of Gem-based utilities for the Atari ST, has moved to the Amstrad PC (and other PC compatibiles with Gem) with *K-Spread 2*.

According to Jon Day, Kuma's sales manager, *K-Spread 2*, a spreadsheet, "is the first in our data-compatible series of Gem-based applications for PC compatibles. Supporting packages such as *K-Graph 2* will be released very soon."

More details from Kuma, 12 Horseshoe Park, Pangbourne, Berks (07357 4335).

PRESIDENT

Throughout history, in times of anguish and need, there have arisen great leaders who have turned away the tides of defeat, deprivation and slavery. They have secured not only protection and prosperity for their peoples but also a place in the history of mankind.

Dare you stand beside them?

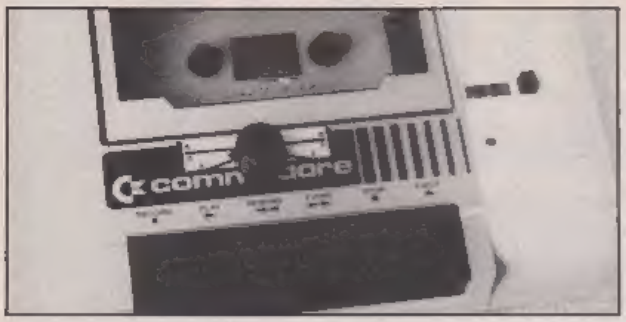
Measure yourself against the evil forces of today – total war – epidemic – starvation – poverty –
and prove that you have the power to be

PRESIDENT

Designed and programmed by Kevin Toms, the creator of the all-time classic "FOOTBALL MANAGER"

AMSTRAD £9.95 SPECTRUM £8.95
COMMODORE 64 £9.95
COMMODORE 64 (DISK) £14.95

Addictive Games Ltd
10 Albert Road · Bournemouth
Dorset BH1 1BZ · Tel: 0202·296404



Tape upgrade aids alignment

LOAD-IT is a data-recorder modification that makes it easier to vary tape alignment. The device, basically an adjusting knob with calibrated scale, can be supplied in kit form or can be fitted by the manufacturer.

It costs £19.95 for the Commodore version, which includes an internal speaker, or £12.95 for other data recorders. Kit versions are £9.95 and £7.75 respectively.

Details from Load-It, 35 Stretton Road, Solihull, West Midlands B90 2RX (021 745 4970).

Supersoft Zooms in on BBC

ZOOM, Supersoft's Commodore 64 machine code monitor, has now been converted to run on the BBC and Commodore 128. The BBC version incorporates a Commodore-style editor along with a verify function. the 128 version of *Zoom* is claimed to be more flexible than the built-in monitor, and allows any memory configuration to be set up rather than 16 standard banks. The program costs £12.95 for tape or £14.95 for disc versions.

Details from Supersoft, Winchester House, Canning Road, Wealdstone, Harrow, Middx HA3 7SJ.

Flight stuff

MICROSOFT'S *Flight Simulator*, one of the most popular programs for the IBM PC, has gained the ultimate accolade – a series of guidebooks for 'pilots'. The books are being published by Microsoft Press, a joint venture between Microsoft and Penguin Books, and are intended to complement the program.

First out will be *Flight Simulator Co-Pilot*, by Charles Gulick. The book takes you through basic flight and navigation techniques, and is due for publication in late February at £7.95. Second in the series will be *Runway*, which is due out in April.

Details from Penguin Books, 27 Wrights Lane, London W8 5TZ (01-938 2200).

Postal games meeting planned

THIS year's British Play by Mail Conference is to be held at the Porchester Centre, Queensway, London W1 on February 2. The main focus of the conference will be traditional play by mail and *Dungeons and Dragons* type games, but computer and computer assisted games are also to be featured. Tickets are £1.50.

Details from Play by Mail-Players Association, 59 Kiln Court, Newell Street, London E14 7JP.

English spoken

MICRO English is an O level English language tuition and revision course for the Amstrad PCW. It consists of 24 lessons alongside an audio cassette, and is intended to teach the rules of English usage. It costs £24.

Details from LCL, Melody House, Greys Road, Henley on Thames, Oxon RG9 1QU.

Footnotes

MUCH aheming, uneasy shifting of feet and before my time guvnoring round at Telecom Towers as *Superman*, giant space turkey of Christmas '85, re-enters the software charts at number 24. We pass no comment on the game's value, but recall a Beyond operative many moons ago telling us – on the record – that the Spectrum version was "dreadful".

As two thirds of the large pile of remaindered stock currently being shifted seems to be Spectrum this comment seems peculiarly pertinent one year on.

Bad-mouthing seems to be in fashion. Two "reputable" computer dealers approached by a small business for a PC system came up with quotes not only beyond Amstrad prices, but beyond (lot of Beyonds in the column this week) belief.

The price quoted for one Olivetti-based system was £2,800, while lots and lots of other dealers are shifting similar systems around £1,500–£1,800.

Neither of the systems suggested actually did the job the business wanted to do, and when challenged on pricing the dealers bashed on about how unreliable Amstrad's machines were.

Not half as unreliable as some dealers . . .

Ariola is meanwhile dipping its toes into the strategy market, one of several new releases being *Blitzkrieg*, where you lead the German forces in a "historically and geographically accurate" assault on Britain.

If it's that accurate we assume the game involves hanging around in the Channel ports for a year or so, then getting bored and attacking Russia instead. Look out for *Blitzkrieg 2* . . .

DIARY DATES

FEBRUARY

17–20 February
Which Computer? Show
NEC, Birmingham
Details: Mainly business exhibitors
Price: £5
Organiser: Cahners Exhibitions, 01-891 5051

MARCH

20–22 March
The Electron & BBC Micro User Show
UMIST, Manchester
Details: Software, hardware and peripherals for Acorn's micros
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

APRIL

24–26 April
The Atari Computer Show
Novotel, London W6
Details: First chance for Atari to show off exciting new strategy
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

MAY

8–10 May
The Electron & BBC Micro User Show
New Horticultural Hall, London
Details: Software, hardware and peripherals for Acorn's micros
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

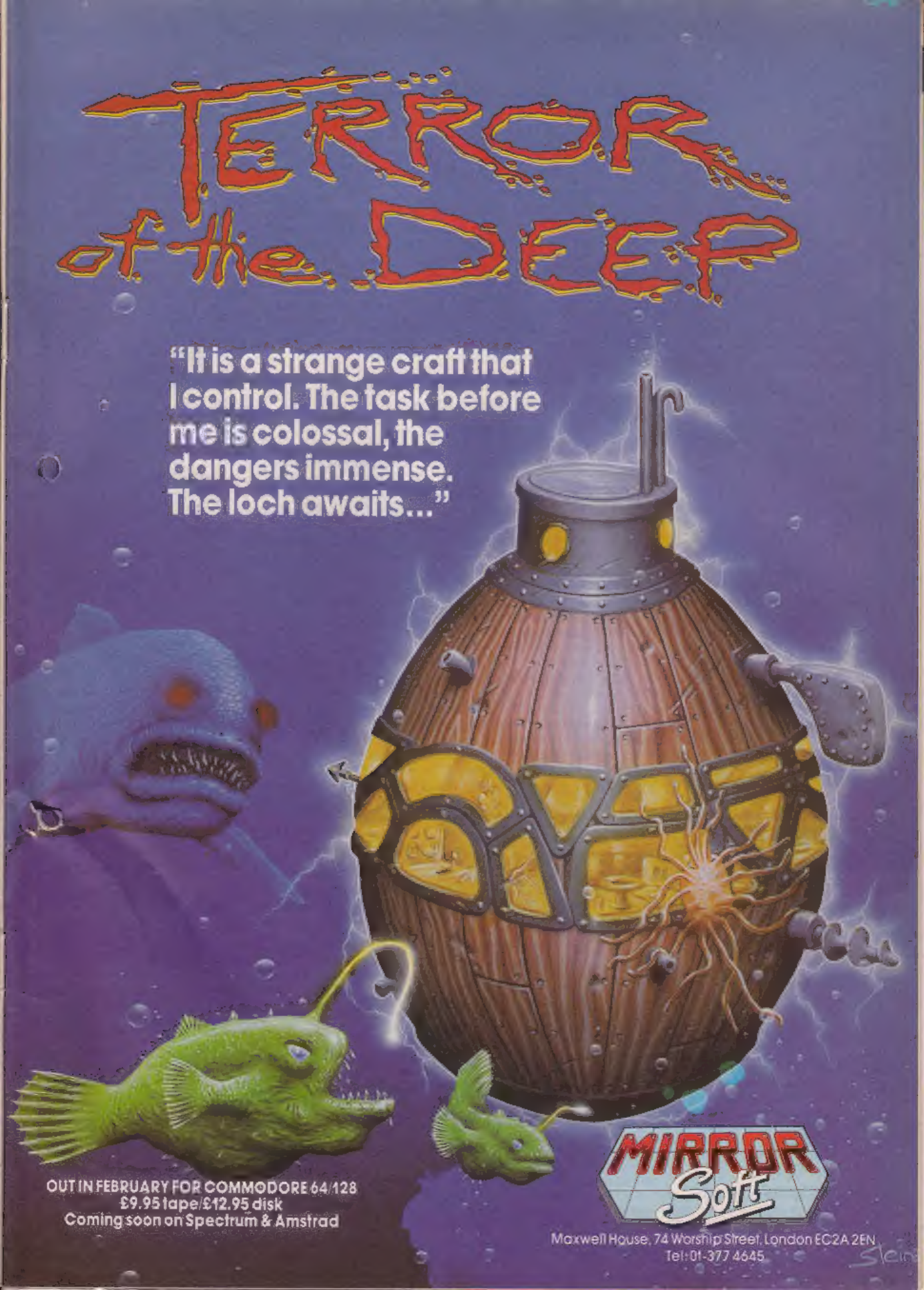
JUNE

12–14 June
The Commodore Computer Show
Novotel, London W6
Details: Software, hardware and peripherals for Commodore range of machines
Price: £3 adult, £2 children, £1 discount for advance booking
Organiser: Database Exhibitions, 061-456 8835

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

TERROR of the DEEP

"It is a strange craft that I control. The task before me is colossal, the dangers immense. The loch awaits..."



OUT IN FEBRUARY FOR COMMODORE 64/128
£9.95 tape/£12.95 disk
Coming soon on Spectrum & Amstrad

MIRRORSoft

Maxwell House, 74 Worship Street, London EC2A 2EN
Tel: 01-377 4645

Letters

A tip for Zeus

I use the Spectrum Zeus Z80 Assembler, which was published by Sinclair Research, and have found the following tip useful.

If, after using the assembler, *Print Peek 23296* gives the answer 15 (the attribute for white ink on blue paper) then the following two pokes prevent corruption of the printer buffer and, incidentally, allow the assembler to be fully used from 128K Basic.

```
POKE 62696 , 255
POKE 62697 , 2
```

G Wearmouth
London N17

Alive and kicking

With reference to your article stating that the Opus Discovery disc drive is dead, let me say that it is alive and kicking, and resides with the Opus Discovery User Group at the address below.

It's about time Amstrad/Sinclair realised that a twelve minute load for a 128K game will send everybody to sleep and kill off the machine, while waiting in the wings there is a disc drive of excellent specifications for the taking.

Peter Lilley
8 Raynham Crescent
Black Hill
Keighley
West Yorks

Wintersoft hibernating?

I would like to get in contact with Wintersoft, which produced *Ring of Darkness* for the Dragon many years ago. I would like to convert and improve the game on my Atari ST using C, but need to check some details and the copyright situation.

Joel Hughes
Pontypool

Wintersoft certainly no longer operates under that name; can anyone help Mr Hughes?

Fast talking

With regard to the letter from Ivan Wilson, No Fast Loads?, I have a Commodore 128 and 1571 disc drive, and would like to say that it is nonsense to say that the 1571 will not cope with fast loaders (with the exception of Elite).

Ivan should try Digital Integration's *Tomahawk* helicopter simulator, and see the speed it loads at. When I use the 128 in 64 mode I also use the Epyx *Fast Load* cartridge; this speeds things up by about six times. It's not the fast-loaders Ivan should worry about, it's the dopes in the computer shops.

If Ivan had taken the shop's advice and bought a 1541 to use CP/M, it would have loaded with the speed of a stunned slug and would not have been able to use discs from other computers, since the 1541 is single sided. Don't listen to the idiots in the shops; getting the 1571 is the best move you could make. I have over 200 discs of software and have had very few problems since upgrading from the 64 to the 128 and 1571.

James Strang
Manchester

Zeus bytes back

Anyone using Crystal's Zeus assembler on the 128K Spectrum will find that on exit to Basic to run their code, or to save any code or source file, the machine will crash.

This is because on running Zeus does a block move of 768 bytes to change the screen colour, 22528 to 23296; this block move is also used when you clear the screen.

As the 128K Spectrum uses the Printer buffer (address 23296) for extra routines, the Zeus block move will corrupt the first byte at 23296. The answer is to change the 768 bytes to 767, rectifying the problem.

To do this, *Clear 32767* and *Load""Code*, so that Zeus will load but not run. Now *Poke 62696,255, Poke 62697,2*. To run Zeus, call it as the manual tells you to: *Print Usr 57344*. Zeus code starts at 57344 and is 6800 bytes long. My modified copy now works exactly as before, except for the printer option.

R Wilkinson
Peterborough

The much-maligned MSX

Home computer owners tend to have a narrow field of opinions, normally formed around the machine which they own. This is understandable, since other machines, each with their own peculiar quirks, are obviously alien to them.

There has never been a better example of narrow mindedness than the letter from Mark Smith of Somerset. (PCW Vol 6, No 3).

As a subscriber to your magazine for more than four years, currently owning three computers (from a small Tandy portable through to an IBM PC), I am able to offer my humble opinion without any biased views, that the MSX system IS a failure. It has a tiny percentage of owners compared to other machines. Despite Mr Smith's comment, the software market is laughable, most certainly not big, nor even very popular. This fact is confirmed by the evidence that there are almost

Puzzle

Puzzle No 243

Triangular numbers are those in the series 1 +2 + 3 + 4 + 5 + . . . etc. This triangle of dots represents the first five triangular numbers:

These numbers are 1, 3, 6, 10 and 15, because each of these numbers of dots can be arranged into a perfect triangular arrangement. By enlarging the triangle an infinite number of triangular numbers can be found.

However, can you find: a) the smallest triangular number which consists of the nine digits 1 to 9, each digit appearing once only (no zero); and, b) the largest number with these conditions.

Solution to Puzzle No 238

Answer: 'A' is equal to 244 and 'B' is equal to 148.

We can see from the grid that A has a cube with eight digits, so A must lie somewhere between 215 and 464. This range can be further reduced as its square has only five digits. Therefore A must lie between 215 and 316. Listing 'A' tests all of these values, the corresponding squares and cubes being converted into string variables. This allows us to check for matching digits in line 40. There are two possible values for A which have the relevant digits matching in the square and cube. These values are 244 and 315.

Program 'B' tests for possible values for variable B. As A must be one of the two possibilities given above, B must have a middle digit '4' and the middle digit of its cube a '2', or it must have a middle digit a '5' with the middle digit of the cube a '5'. This is tested for in lines 50 and 60.

Of the two possibilities printed out, one can be discounted as it contains a number of zeros, leaving just the one solution.

Winner of Puzzle No 238

This week's winner is Peter Ross, of Workington, Cumbria, who will receive £10.

Rules

The closing date for Puzzle 243 is February 15. Answers should include a program listing if possible.

```
>
Listing 'A'
>
   10 FOR A=215 TO 316
   20 S=A*A:C=S*A
   30 A$=STR$(A):S$=STR$(S):C$=STR$(C)
   40 IF MID$(A$,2,1)=MID$(C$,2,1) AND
MID$(S$,3,1)=MID$(C$,3,1) THEN PRINT
A$,S
$,C$
   50 NEXT A
>
Listing 'B'
>
   10 FOR B=111 TO 215
   20 B$=STR$(B)
   30 IF MID$(B$,2,1)<>"4" AND
MID$(B$,2,1)<>"5" THEN 70
   40 C=B*B*B:C$=STR$(C)
   50 IF MID$(B$,2,1)="4" AND
MID$(C$,4,1)="2" THEN PRINT B,C$
   60 IF MID$(B$,2,1)="5" AND
MID$(C$,4,1)="5" THEN PRINT B,C$
   70 NEXT B
```

never any MSX programs in the best-selling tables of either games or business software. To come to the defence of an innocent publication which is doing its best, his provocative comments to your magazine are at the very least, unnecessarily rude.

If he could just sit back, take stock of the market, and properly analyse his statements (perhaps even put the facts through his computer!), he will realize he is talking out of the back of his head, or perhaps even a little lower!

Keith Alston
Wivenhoe

discs at £2.99. Try shopping around a bit more!

No lunatics here

Tony Kendle is wrong to say that PCW owners "can't do anything about the lunatic prices of ribbons". They certainly can! They can send their old ones to Aladdink for re-inking, as can owners of many other types of printer. See classified ads for details.

Nick Godwin
Aladdink
Berwickshire

"This must be the de-luxe version"

Slippery discs

Back in *Popular*, November 13, your News Desk reported Amstrad CF2 disc prices had been reduced to £2.99.

Since then I have been to all the computer shops and high street chains in Leeds who stock and sell the discs only to be met with blank stares and "Our discs are £4.99"

I have even launched forth from Lave in my trusty Cobra to scour the galaxies but still to no avail.

I now turn to you, can you help me find some of these mythical beasties?

S Hazelgrave
Leeds

Off the top of our heads, Pinner Wardpro of Dawlish-Drive, Pinner, Middx, and Computers by Post (credit card hotline no: 01-760 0014) are both selling ten-packs of CP2

A non-Enterprising student

Having been an Enterprise owner for two years, and during this time putting in an investment of nearly £600, I have sold up due to the frustration of not being able to walk into a high street shop and obtain add-ons.

As a computer studies student I relied on it a lot, and I'm now looking at the Atari ST range, but have come across a question no-one so far has been able to answer.

The 1040STF was designed to be able to take the blitter chip, forthcoming sound processor and the TT 68020 co-processor unit, and the circuit board allows for these extras.

The 520STM circuit board was only able to take either a plug-in blitter or a solder-on blitter with additional Ram.

Is the new 520STFM designed like the 1040STF (but with less Ram and single-sided disc drive), being able to take the co-processor, blitter and other forthcoming developments on the circuit board?

Also could you please tell me when the next Hanover Fair is as I am not investing in Atari until then. Like many hopefuls I foresee a price reduction.

G P Dawes
Letchworth, Herts

Back to the future

Do you publish an Index for 1965? I've looked in my back numbers and cannot find one anywhere.

S W Hammond
Selston

Most of us were still in infants' school in 1965. If perchance you mean 1985, try *Popular*, March 6, 1986 (Vol 5 No 10).

Black to basics

We return to Game One in our Readers vs *Colossus* chess tournament this week, with the completion of move ten in the game.

The Readers, playing black, have voted to move the bishop forward – see diagram below for details. *Colossus*, playing white, has turned its attention to the ? column pawn.

Back to black

Now we need your suggestions for the next Readers' move. Send your suggested move to *either* Inter-Mediates (*Popular* Chess), Freepost, Sawbridgeworth, Herts CM21 6YA (you do not need to use a stamp with this address), *or Popular* Chess, Unit 2, The Maltings, Sawbridgeworth, Herts CM21 0PG (with a stamp). Freepost is slower than normal mail, so if you want to save money on stamps, post your entry promptly. Entries must reach either address by Wednesday, February 4.

The move which gets the most votes will be entered into the game. Results and *Colossus's* response will be published in two weeks' time

Prizes

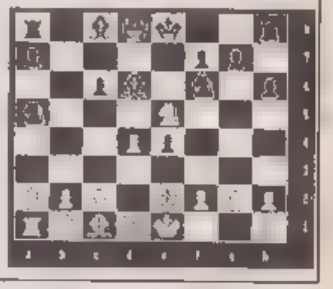
A British Museum reproduction Arran chess set will go to the person suggesting the most accepted moves at the end of the game. Five copies of *Colossus Chess 4* (available for most popular micros) will go to the most consistent entrants for the duration of the game.

Next week, we return to Game Two, where the Readers are playing white.

Game One

The moves so far:

1	Pe2–e4	Pe7–e5
2	Ng1–f3	Nb8–c6
3	Bf1–c4	Ng8–f6
4	Nf3–g5	Pd7–d5
5	Pe4xd5	Nc6–a5
6	Bc4–b5+	Pc7–c6
7	Pd5xc6	Pb7xc6
8	Bb5–e2	Ph7–h6
9	Ng5–f3	Pe5–e4
10	Nf3–e5	Bf8–d6
11	Pd2–d4	?



Correction

Unfortunately the data loader for the Spectrum +2 disassembler printed recently won't work. This is the correct version.

```
10  FOR a=32000 TO
    33279 STEP
20  LET b=0
30  PRINT a;" : ";
40  FOR f=0 TO 7
50  INPUT x: PRINT x;" ";
    :LET b=b+x
60  POKE a+f,x:NEXT f
70  INPUT " Checksum =
    ";c
80  IF c<> >b THEN PRINT
    "Error ! Re-type":GO
    TO 30
90  NEXT a
```

Too Busy Earning a Living To Make Any Real Money?

You think you've got problems?

Well, I remember when a bank turned me down for a $200 loan. Now I lend money to the bank - Certificates of Deposit at $100,000 a crack.

I remember the day a car dealer got a little nervous because I was a couple of months behind in my payments - and repossessed my car. Now I own a Rolls Royce. I paid $43,000 for it - cash.

I remember the day my wife phoned me, crying, because the landlord had shown up at the house, demanding his rent ... and we didn't have the money to pay it.

Now we own five homes. Two are on the oceanfront in California (I use one as my office). One is a lakefront "cabin" in Washington (that's where we spend the whole summer - loafing, fishing, swimming, and sailing). One is a condominium on a sunny beach in Mexico. And one is snuggled right on the best beach of the best island in Hawaii - Maui.

Right now I could sell all this property, pay off the mortgages - and - without touching any of my other investments - walk away with over $750,000 in cash. But I don't want to sell, because I don't think of my homes as "investments." I've got other real estate and stocks, bonds, and cash in the bank ... for that.

I remember when I lost my job. Because I was head over heels in debt, my lawyer told me the only thing I could do was declare bankruptcy. He was wrong. I paid off every dime.

Now, I have a million dollar line of credit; but I still don't have a job. Instead, I get up every weekday morning and decide whether I want to go to work or not. Sometimes I do - for 5 or 6 hours. But about half the time, I decide to read, go for a walk, sail my boat, swim, or ride my bike.

I know what it's like to be broke. And I know what it's like to have everything you want. And I know that you - like me - can *decide* which one it's going to be. It's really as easy as that. That's why I call it "The Lazy Man's Way to Riches."

So I'm going to ask you to send me something I don't need: money. £10 to be exact. Why? Because I want you to pay attention. And I figure that if you've got £10 invested, you'll look over what I send you and decide whether to send it back... or keep it. And I don't want you to keep it unless you agree that it's worth at least a hundred times what you invested.

Is the material "worth" £10? No - if you think of it as paper and ink. But that's not what I'm selling. What I am selling is information. *More* information than I give when I'm paid $1000 as a guest speaker. *More* information than I give in a one-hour consultation for $300.

But you're really not risking *anything*. Because I won't cash your cheque or money order for 31 days *after* I've sent you my material. That's the deal. Return it in 31 days - and I'll send back your cheque or postal order - uncashed.

How do you know I'll do it? Well, if you really want to be on the safe side, postdate your cheque for a month from today - *plus 2 additional weeks*. That'll give you plenty of time to receive it, look it over, try it out.

I know what your thinking. "He got rich telling people how to get rich." The truth is - and this is very important - the year before I shared "The Lazy Man's Way to Riches," my income was $216,646. And what I'll send you tells just how I made that kind of money... working a few hours a day ... about 8 months out of the year.

It doesn't require "education." I'm a high school graduate.

It doesn't require "capital." Remember I was up to my neck in debt when I started.

It doesn't require "luck." I've had more than my share. But I'm not promising you that you'll make as much money as I have. And you may do better. I personally know one man who used these principles, worked hard, and made 3 million dollars in 8 years. But money isn't everything.

It doesn't require "talent." Just enough brains to know what to look for. And I'll tell you that.

It doesn't require "youth." One woman I worked with is over 70. She's travelled the world over, making all the money she needs, doing only what I taught her.

It doesn't require "experience." A widow in Chicago has been averaging $25,000 a year for the past 4 years, using my methods.

What does it require? Belief. Enough to take a chance. Enough to absorb what I'll send you. Enough to put the principles into *action*. If you do just that - nothing more, nothing less - the results will be hard to believe. Remember - I guarantee it.

You don't have to give up your job. But you may soon be making so much money that you'll be able to. Once again - I guarantee it.

I know you're sceptical. Well, here are some comments from other people. (Initials have been used to protect the writer's privacy. The originals are in my files.) I'm sure that, like you, these people didn't believe me either when they clipped the coupon. Guess they figured that, since I wasn't going to deposit their cheques for at least 31 days, they had nothing to lose.

They were right.

And here's what they gained:

"Thanks to your method I'm a half millionaire"

"Thanks to your method I grossed about $500,000. Would you believe last year at this time I was a slave working for peanuts?"

G.C., Toronto, Canada.

"$24,000 in 45 days"

"...received $24,000.00 in the mail the last 45 days.

"Thanks again."

Mr. E.G.N., Matewan, W.VA.

"Made enough to retire at 41"

"If it hadn't happened to me, I wouldn't have believed it... A few years ago, I had nothing to lose. I was unemployed and broke.

"Now, thanks to you and the 'Lazy Man's program, I have made enough money (at age 41) to retire in style."

R.A., Huntingdon Beach, Calif.

"There's no stopping me"

"Since I've got your (Lazy Man's Way to Riches) in July, I've started 4 companies - there's no stopping me and I'm so high I need chairs to keep me on the ground."

M.T., Portland, OR

"Wow, it does work!"

"Oddly enough, I purchased Lazy Man's Way to Riches some six months ago or so - read it - and really did nothing about it. Then, about three weeks ago, when I was really getting desperate about my financial situation, I remembered it, re-read it, studied it, and this time put it to work and WOW - it does work! Doesn't take much time, either... I guess some of us just have to be at a severe point of desperation before we overcome the ultimate laziness: procrastination."

Mr. J.K., Anaheim, CA

"Made $70,000"

"A $70,000 thanks to you for writing The Lazy Man's Way to Riches. That's how much I've made.

"I use this extra income for all of the good things in life, exotic vacations, classic automobiles, etc. Soon I hope to make enough to quit my regular job and devote full time to making money the easy way."

Mr. D.R., Newport Beach, CA

"$260,000 in eleven months"

"Two years ago, I mailed you ten dollars in sheer desperation for a better life. One year ago, just out of the blue sky, a man called and offered me a partnership. I grossed over $260,000 cash business in eleven months. You are a God sent miracle to me."

B.F., Pascagoula, Miss.

"Steadily upward ever since"

"I ordered Lazy Man's Way to Riches in June ... by September, my career was launched and has gone steadily upward ever since."

Mrs. B.A., Walnut Creek, CA

"$7,000 in five days"

"Last Monday I used what I learned on page 53 to make $7,000! It took me all week to do it. But that's not bad for five day's work."

M.D., Topeka, Kansas

What I'm saying is probably contrary to what you've heard from your friends, your family, your teachers, and maybe everyone else you know.

I can only ask you one question: How many of them are millionaires?

So it's up to you.

A month from today, you can be nothing more than 30 days older ... or you can be on your way to getting rich. You decide.

The wisest man I ever knew told me something I never forgot: "Most people are too busy earning a living to make any money."

Don't take as long as I did to find out he was right.

I'll prove it to you, if you'll send in the coupon to my publisher now. I'm not asking you to "believe" me. Just try it. If I'm wrong, all you've lost is a couple of minutes and a postage stamp. But what if I'm right?

Some have called it a Miracle. Some have called it Magic. You'll call it "The Secret of the Ages."

As for me, I thank God that before he died Millionaire Joe Karbo left, for all to share, the secret of "The Lazy Man's Way to Riches." The above story, which is in his own words, is his gift to you.

PROOF!

Don't take my word for it. These are excerpts from articles in newspapers and magazines:

Time:

He only works half the year in his stunning office on California's Sunset Beach, and even when he's there he puts in short hours... In other words, Joe Karbo, 48, is the prototype for... "The Lazy Man's Way to Riches."

Boston Herald-American:

The book has drawn hundreds of letters from persons who have profited by it...

Los Angeles Herald-Examiner:

An unpretentious millionaire, Joe Karbo of Huntingdon Harbor is a vibrant, living testimonial to his intellectual, pragmatic conviction.

Money Making Opportunities:

Maybe Joe Karbo has the secret. Don't you think you owe it to yourself to find out what it is all about?... I just finished it - and I'm off on a vacation myself. Get the idea?

Sworn Statement.

"On the basis of my professional relationship as his accountant, I certify that Mr. Karbo's net worth is more than one million dollars."

Stuart A. Cregg

Chartsearch Ltd.,
11 Blomfield Street,
London EC2M 7AY

You may be full of beans, but what have I got to lose? Send me the Lazy Man's Way to Riches. *But don't deposit my cheque or postal order for at least 31 days after it's in the mail.* If I return your material - for any reason - within that time, return my uncashed cheque or postal order to me.

☐ On that basis, here's my £10
☐ Please charge my credit card

A/C Number (Access/Visa/Diners/Amex)

Name

Address

Code

Signed Date

(Please Print Clearly)

Please allow 14-21 days for delivery

REGISTERED IN ENGLAND No. 1540223

High quality prints

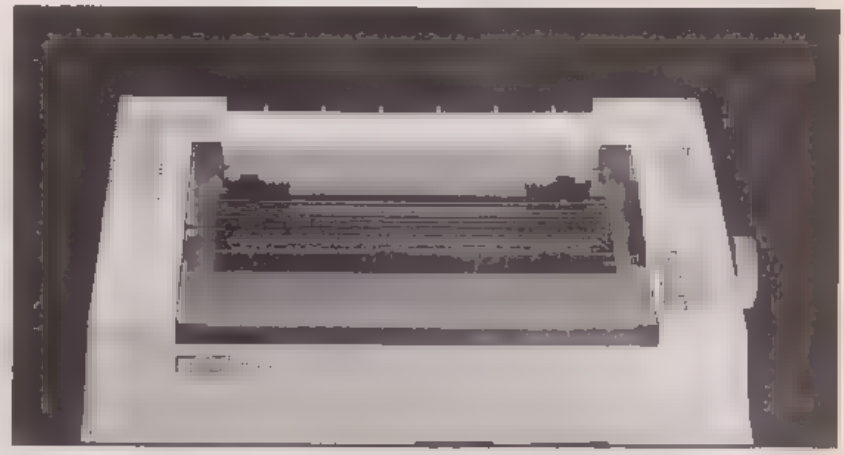
Keith Hoyle found himself impressed by MicroPeripherals' MP 200 dot-matrix printer. It's not cheap, but performs to a high standard

The MicroPeripherals MP 200 gives the impression of being a well-built printer which could do a fair day's work, and not suffer a backache afterwards!

The printer is a badged version of a Nakajima product, and comes complete with a power cord and plug, a paper feed separator and manual. The standard Centronics interface comes in the form of a plug-in circuit board which fits neatly at the back under a plastic cover. There's also an RS-232 option.

Also at the back of the printer is a sliding cover which lifts to reveal two banks of eight DIP switches. These allow you to set standard or IBM mode, perforation skip length, text mode and so on. The printer buffer can also be set from 1K to 7K. All these facilities, plus others, can also be set through software, making the MP 200 very versatile indeed.

The MP 200, as its name suggests, can print at 200 cps in draft mode. In NLQ mode, speed is 40 cps; this gives outstanding quality, especially when using the emphasised mode at the same time. Condensed, expanded, and differently pitched texts are also available.



MP 200 – Print sample

The MP 200's footprint is 435 x 345 x 110mm, and weight is around 8Kg. The 157-page manual is in ring-bound A4 format, and is pretty thorough, explaining how to access all the printer's modes of operation quite nicely.

The front panel of the MP 200 has several soft-touch buttons on the right hand side. These select NLQ mode on/off, character pitch (10, 12, or 17 cpi and proportional spacing), on/off line, line feed and form feed. Each has its own LED, and there are also LEDs for power, ready, and paper out.

Usefully, the MP 200 takes friction or tractor feed paper, from 110 to 250mm wide. With friction feed, the paper bail release lever doubles as an auto paper feeder; like the Amstrad PCW 8256's printer, you position the paper so that it is just gripped by the rollers, pull the lever towards you, and the paper is advanced one inch. Tractor feed is more fiddly, but no more so than with any other printer!

The MP 200 uses inexpensive (£3–£4) Epson RX80-type ribbons. These are easy to change and come in several different colours. The manifold lever just inside the noise cover allows you to alter the distance between print head and ribbon, giving lighter or darker print. Pressing the *Select* button while the printer is working makes it stop at the end of the next line, allowing you to change the ribbon to another colour before continuing with the following line.

Although the retail price of the MP 200 is over that of comparable machines such as the Citizen 120D, Epson LX80, Commodore MPS1000 and Star NL10, it's worth shopping around for bargains.

I don't feel that the competitors can touch the MP 200 for speed or quality of print, and my only regret was not being able to afford the MP 201, which has the same spec as the 200, but with a wider 16 inch carriage. With the reassurance of a two year warranty, I could recommend the MP 200 to anyone.

Hardware *MP 200 Printer* **Micro** Any with standard Centronics/RS-232 **Price** £378.35 **Supplier** MicroPeripherals, Intec Unit 3, Hassocks Wood, Wade Road, Basingstoke, Hants. Tel: 0256 473232.

Pro power for the PCW

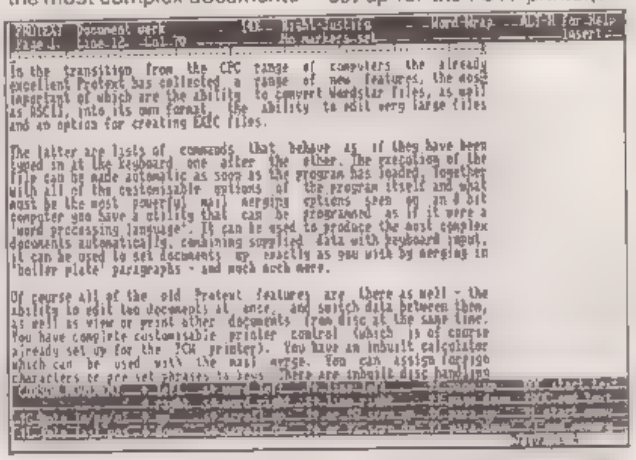
Protext arrived on my desk just in time to earn itself the (unofficial) title of 'PCW utility program of 1986'. The program is actually an amalgamation of the three utilities sold for CPC machines – the *Protext* word processor, the *Promerge* mail merge extension and *Prospell* spelling checker.

In the transition from the CPC range of computers the already excellent *Protext* has collected a range of new features, the most important of which are the ability to convert *Wordstar* files, as well as Ascii, into its own format, the ability to edit very large files and an option for creating *Exec* files.

The latter are lists of commands that behave as if they have been typed in at the keyboard one after the other. The execution of the file can be made automatic as soon as the program has loaded.

Together with all of the customisable options of the program itself and what must be the most powerful mail merging options seen on an 8-bit computer you have a utility that can be programmed as if it were a 'word processing language'.

It can be used to produce the most complex documents



automatically, combining supplied data with keyboard input, it can be used to set documents up exactly as you wish by merging in 'boiler plate' paragraphs – and much much more.

Of course all of the old *Protext* features are there as well – the ability to edit two documents and switch data between them, as well as view or print other documents from disc at the same time.

You have an inbuilt calculator which can be used with the mail merge. You can assign foreign characters or pre set phrases to keys. There are inbuilt disc handling options that let you copy or format discs without even leaving the program (you can even format or copy CPC data discs using the PCW).

Protext is a command-based word processor rather than a menu-driven one like *Locoscript*. Not only does this make it much faster to use but it makes it possible to get the most from the *Exec* files. Learning to use the program is however made simple by an exhaustive manual and the most logical selection of keypress commands I've ever seen on a word processor.

A welcome improvement on the old version is a complete inbuilt help option that gives a summary of every command and keypress.

Accept no substitutes, this is the genuine as-seen-on-TV actual-size article, this is *the* word processor for the PCW. Its range of features leaves *Wordstar* looking basic and its lightning speed leaves *Locoscript*, in even its improved forms, squeaking and creaking at the joints.

Tony Kendle

Program *Protext* **Micro** Amstrad PCW or CPC with CP/M Plus **Price** £89 **Supplier** Arnor, 118 Whitehorse Road, Croydon, Surrey CR0 2JF.

Look after your money

Until recently, any form of personal accounting on a home computer was largely considered a waste of time.

What with the laborious chore of loading and saving data to tape and the relatively unsophisticated programs – it was simply easier to use the 'back of an envelope' method of accounting for most households.

The advent of disc-based systems, however, and the increasing interface between the arenas of home and business computing have changed things a little – with the admiral *Plan-It* from Database Software as the latest example.

This package consists of a suite of four programs, namely *Personal Accounts, Financial Diary, Card Index* and *Loan Calculator* – which between them should satisfy the needs of most home users.

Personal Accounts, as you might expect, comprehensively deals with the area of day to day financial transactions, such as bank account, cash dispenser and credit card transactions, together with another section breaking down your normal outgoings (bills, food, car, etc) into separate headings that can be renamed, if need be.

Cheque numbers

Quite simply, you enter in your expenditure under each section, and each financial transaction – giving dates and cheque numbers when prompted.

If kept up to date, this can provide you with complete bank statements (unlike the abbreviated print-outs supplied by most clearing banks), together with itemised expenditure (yes, you did spend that much on booze last month!) and an up to date, accurate picture of your financial situation.

The penalty for this detail is that you must be meticulous in entering the relevant data.

Card Index provides a reasonably flexible database that will serve as a primitive mailing list, whereas *Financial Diary* is an events/expenses reminder utility that includes search facilities.

Loan Calculator provides little more than a 'plug in the numbers' facility for working out loan repayments, but might come in useful for those once in a while 'what if?' sessions.

All programs are used via clear and simple menus that shouldn't be too confusing for new users, and the accompanying manual, although concise, is adequate.

Available for the CPC and PCW machines, *Plan It* can be recommended if you feel the need for stringent financial control in your life – and have the willpower to keep up the entries.

John Cook

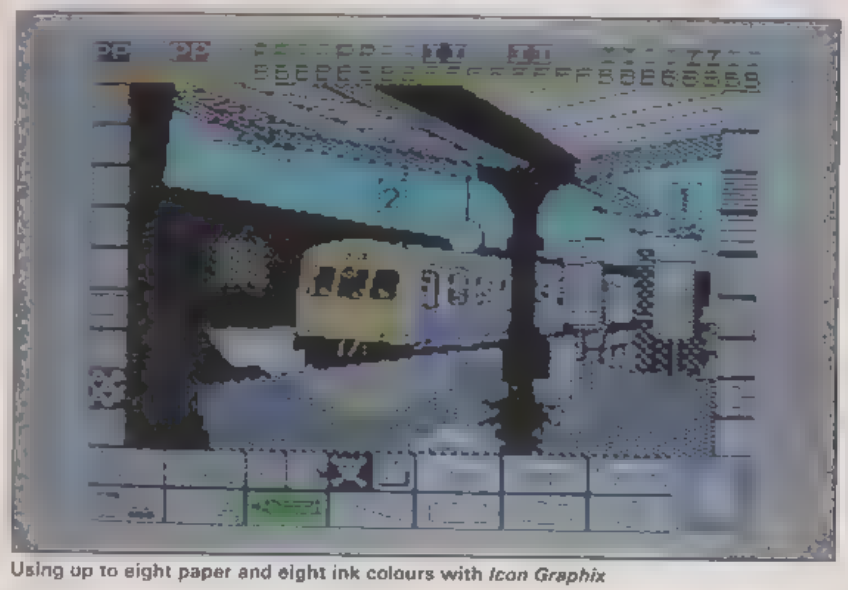
Program *Plan It* **Micro** Amstrad CPC/PCW **Price** £24.95 (disc) £14.95 (tape – CPC only) **Supplier** Database Software, Europa House, 68 Hazel Grove, Stockport SK7 5NY.

Icon see clearly now

Chris Jenkins assesses the improvements made in ASL's Icon Graphix 128, a development from its original Spectrum 48K package

Icon Graphix 128 is a much extended version of a fairly successful 48K program, and incorporates many drawing functions first seen in the better-known Rainbird *OCP Art Studio* or Softek's *The Artist*.

The main improvement, of course, is that the 128K version has more working memory space. This has allowed ASL to incorporate two extra menus of drawing facilities.



Using up to eight paper and eight ink colours with *Icon Graphix*

Spraycan

Like the original 48K version (which is still available at £9.95), *Icon Graphix 128* makes great use of said wee pictures in its function selection menus. You can use either a Kempston joystick, Kempston mouse, Interface II joystick or keyboard to control the cursor, which changes shape according to the current function. This gets a mite confusing when the spraycan cursor, for instance, is superimposed over the felt-tip icon; possibly a case where the pull-down menus of the OCP *Art Studio* were a better solution to the problem.

Selecting new patterns

Another annoying oddity is the display of fill patterns available, which appear around the drawing area rather than on a separate page. Although this makes it easier to select new patterns, I would have preferred a larger drawing area. Being able to push the drawing window around is little consolation.

So what are the real improvements? The main menu features are exactly the same as the original version: fill, brush, pen, line, square, circle magnify and so on.

The magnify option is less useful than that of, say, *The Artist*; it blows up the selected area to the whole screen, rather than filling a small window which can be worked on in reference to the main picture.

The other options are pretty standard, each one being illuminated in yellow as you select it; selecting shapes gives you access to a choice of sixteen pen shapes, although there's only one spray can shape available.

The 34 built-in fill patterns can be edited in the pop-up pattern box, the magnified version being repeated in normal size in the pattern strip. There are also erase and undo facilities on the main menu.

Menu page two brings up a new set of option boxes at the bottom of the screen. These include text entry (there are ten fonts supplied with the package), bold and outline font options, screen clear (this can be undone), horizontal and vertical flip, inverse video, and *Hide* which displays the full drawing without menus. For some reason, most of these options are labelled with text rather than icons, and there are several functionless boxes inhabited only by spiderwebs (you think I'm joking!) This goes to give the program an unfinished feel which does not inspire great confidence.

Cut and paste

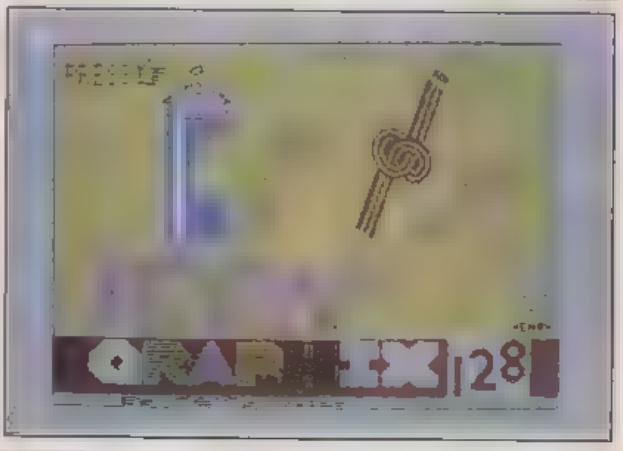
Most of the facilities on the third menu page are concerned with cut and paste, the area where *Icon Graphix 128* shows the most improvement. A cut area can be defined using a box, or, usefully, by outlining an area. The area can then be cut out and moved, repeated, inverted, and, if you have used the box cut, have everything inside outlined. Many of these facilities are only otherwise found on Softek's *Artist 2*.

The whole program can be transferred to microdrive, and you can save pictures, patterns and cuttings to tape or microdrive. The biggest failure of the program, though is that it can only print out to Sinclair or Alphacom printers.

Oddities

Overall *Icon Graphix 128* is fairly straightforward to use, but has some oddities and omissions. Given that, at £12.95, it is not as expensive as *OCP Art Studio* or the *Artist 2*, so you may not want to dismiss it out of hand; but both these programs have extra facilities and polish which make *Icon Graphix 128* look unfortunately incomplete.

Program *Icon Graphix 128* **Micro** Spectrum 128/Plus 2 **Price** £12.95 **Supplier** Audiogenic, PO Box 88, Reading, Berks.



Time is of the essence

Tony Kendle finishes the guide to level one of Nosferatu and introduces some useful tips for Tau Ceti and Dan Dare

Let's finish off the tips for level one of Piranha's *Nosferatu* first:

"Leave the dining room now and cross the corridor. If you get attacked by the bats just hit them with the sword – its easy to do as long as you are facing the correct way. Get underneath the balcony and the bats will not be able to get you – walk to the right, past the staircase until you see another door to the bottom right. This is the library.

"In the library search the desk drawers for food and the deeds. If you still haven't got them you need to tackle the secret passageway, and to do that you need to light the lamp. Go to the bottom right hand room of the library.

"Move the ladder to the left of the gap in the bookcases and climb up it. You will find yourself in a secret room where there may be some food and also, on the desk, a box of matches. Take these and you will have a lit lamp.

"Go back to the library and on the bookcase on the right hand wall you will find the secret passageway.

"Continue down the stairs, killing bats, and turn left at the bottom. Go to the top left and search the cupboard for food. Then go through the arched door in the top right into a graveyard.

"Keep going and leave through the top left door. Here you may find the deeds in the desk or the fireplace.

"Off a door and down some stairs you will find Nosferatu the vampire. Best thing to do is not to bother tackling him. The sword doesn't even dent him. You could try taking the garlic or crucifix to him but you either have to do without the sword or the light to do so – which is essentially fatal.

"Leave through the bottom left (there is some food in the fireplace), go left and back up the stairs. You come out in a room with a key on a rack – this room is actually on the opposite side of the hall to the dining room.

"From this room you can leave by the middle left corner where you find yourself behind some cupboards – carrying on to the left brings you to the kitchen with loads of food

"Returning to the key room leave by the bottom right and go right along the corridor, staying under the balcony, exit by the door on the top right (don't worry about the dogs) and go down and right to the triple stairs. Drop the deeds here and return to the key room. Take the key off of the left-most rack.

Return back up the corridor to the front door. Unlock this door. Pick up the deeds and you are free ■ go on to level two!"

Many thanks to Chris Stoneham, now does anyone have help for later levels?

On to other business now with some, doubtless welcome, tips for some recent blockbuster Commodore games from Chris Eastwood of Witney. As usual with the tips that Chris sends, you need a reset switch to get the pokes in.

Tau Ceti

"First type in the following listing and save it to either tape or disc for further use.

```
10 FOR T=18590 TO 18592 : POKE T,234 : NEXT
20 FOR T=15325 TO 15326 : POKE T,234 : NEXT
30 FOR T=15175 TO 15176 : POKE T,234 : NEXT
   POKE 15178,234
40 FOR T=15992 TO 15994 : POKE T,234 : NEXT
50 POKE 19828, 191 : POKE 15990, 169 : POKE
   15991,191
60 SYS 8192
```

"When you have saved the listing load in *Tau Ceti* as usual, but when it has loaded reset on the title page. It is important that you don't reset at any other point in the game or the pokes will not work.

"When you have reset the computer load in the listing and run it. You can now play *Tau Ceti* with infinite missiles, infinite flares, infinite AAM's and infinite shield strength making the game much more enjoyable and playable. You can still run into docking buildings though so beware.

Dan Dare (which is also Richard Branson's new nickname, I understand).

"Load *Dan Dare* as usual, but then reset the game on the title page, then type in the following pokes to obtain 24 hours for completing your task.

```
POKE 22888,50
POKE 22889,52
POKE 22891,48
POKE 22892,48
POKE 22903,50
POKE 22904,52
POKE 22906,48
POKE 22907,48
```

"Then type *Sys 22700* and hit *Runstop/Restore* to start the game with a lot more time on your side."

Charts

Top Twenty

1	(1)	Gauntlet	US Gold
2	(2)	Paperboy	Elite
3	(3)	180	Mastertronic
4	(8)	Konami's Coin-op Hits	Imagine
5	(7)	BMX Simulator	Code Masters
6	(4)	Footballer of the Year	Gremlin Graphics
7	(9)	Trivial Pursuit	Domark
8	(–)	Ninja	Mastertronic
9	(6)	Ollie and Lisa	Firebird
10	(5)	Space Harrier	Elite
11	(11)	Computer Hits Vol 3	Beau Jolly
12	(–)	Super Soccer	Imagine
13	(12)	Hit Pack	Elite
14	(10)	Five Star Games	Beau Jolly
15	(13)	Breakthrough	Data-East/US Gold
16	(–)	La Swat	Mastertronic
17	(19)	Speed King II	Mastertronic
18	(15)	Head Coach	Addictive Games
19	(–)	Konami's Golf	Imagine
20	(16)	Flash Gordon	Mastertronic

All figures compiled by Gallup/Microscope

Adorable Activision

One day, all games will be made this way; well, that might be a bit of an exaggeration, but if you, are interested in the future of the computer game then check this one out.

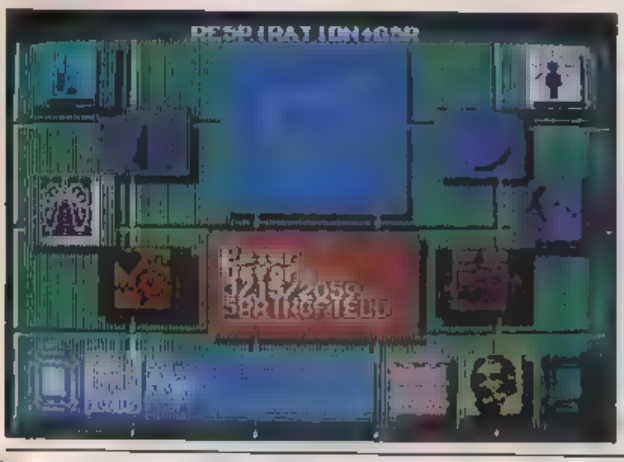
And thank you very much Activision for having the guts to bring it out. Because you can bet your Auntie's pet goldfish that no UK based software house would ever have tried such a venture – a disc-based computer novel.

The British software market is still in the tape-based, small memory, post computer console phase of home computing – a phase that never existed in the comparatively affluent States – so the user base to justify such a product just doesn't exist.

Portal is genuinely something very different from the run of the mill game. The scenario has you (returned from a failed 100 year mission to outer space) sitting in front of a computer console, accessing WorldNet (like Micronet, only with 17 billion terminals) – trying to find out where all the people have gone.

Earth is empty. No sign of human life whatsoever and you must interrogate the equally baffled computer to try and find out where they have all vanished – then maybe follow.

The plot is slowly revealed by accessing each of the 12 databases that make up WorldNet. At first, almost all are empty – but slowly the computer (which has a personality called Homer) begins to remember, and files begin to appear on the database directories.



Some seem to be narrative, conversations picked up by the alert systems of the year 2106AD.

Some are straightforward history lessons and background information on the 21st Century. Others contain bewildering arrays of biochemical and genealogical data on the major personalities that seem to be part of the story.

With each file you read (all this accessing is done under simple joystick control), the computer remembers more, and the story begins to unfold.

Written by Rob Swigart, programmed by Nexa (recently acquired by Mirrorsoft), the package is an experience not to be missed by any science fiction buff.

With *Portal*, information is given to you slowly – bit by bit. It's frustrating but gives an uncannily addictive quality.

On Commodore 64 now (three discs), ST by March; if you've become jaded with the current crop of releases, try this. You'll love it.

Popular Appeal ♦♦♦♦♦

John Cook

Program *Portal* **Micro** Commodore 64 **Price** £24.95 (disc only) **Supplier** Activision, 23 Pond Street, London NW3.

Lair – the remake

Dirk's back. That's all you see of him at the start of this second set of eight episodes from *Dragon's Lair*.

Dirk feels pretty queasy too. He's really up the creek, this time, with very little time to respond to the arrows which show him which channel to take. If he follows them correctly, he's in for a spell of 'dodge the whirlpool'. It's a Dirk's life!

I only saw the Spectrum version of the original *Dragon's Lair* and wasn't too impressed. It was pretty bad graphically and lacked playability. I'm told the Commodore 64 version suffered similar shortcomings. What a pleasant surprise that this time Software Projects seems to have got it right.

The falling disc that started the original was simply frustrating. So are these river caves – but in a way that makes you think you must have one more go. Eventually you'll make it, if you realise that the secret is to concentrate on the appearance of the direction arrows – not the aquatic Dirk.

There are other reaction sequences, as well as traps to tackle, before you attain the final, two part sequence. Rather like the original's dragon challenge, Dirk has to cross dangerous ground as he makes for a magic bottle.

This is more than a worthy successor. If you liked part one – and surprisingly, going by the charts, it seemed that a lot of people did – you'll love this. And if you weren't convinced by the original, this could convert you.

Popular Appeal ♦♦♦♦

John Minson

Program *Dragon's Lair II* **Micro** Commodore 64 **Price** £9.95 (tape), £13.95 (disc) **Supplier** Software Projects, Bearbrand Complex, Allerton Road, Liverpool L25 7SF.

Glory baize

Like golf, snooker has been a popular computer game because it can be easily reduced to estimating an angle. The secret of a good program is to make this process look less mechanical. Well, *Pro Snooker* certainly does that, and the Simulator tag is fully justified.

You position the cue by letting it revolve around the white ball, using coarse and fine tuning keys. Meanwhile, at the top of the screen, you get a view along the cue, which shows any ball that may lie in a direct line with it. You're also able to set spin at this stage, if you want to be particularly flashy.

Taking the shot consists of hitting your trigger key twice; the longer the gap, the weaker the shot, so for the most powerful pots you'll need speedy reactions. This is a purely two player game and each player has a different trigger to stop cheating.

There are lots of other options though, including a useful practice mode that lets you remove balls from the table or set up positions. There's even a Demo game, for dedicated spectators.

Despite this wealth of detail, I do have one or two grumbles concerning playability.

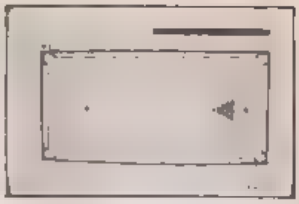
One is a result of the Spectrum's graphics, which means that the balls of a different colour tend to take on chameleon qualities when close, owing to attribute problems.

In fact, because of the accurate scaling, you'll need a very well tuned telly to tell your pink from your brown.

But even if these rather squidgy graphics can make things difficult, practice should make something close to perfect.

Popular Appeal ♦♦♦

John Minson



Program *Professional Snooker Simulator* **Micro** Spectrum 48K/128K **Price** £1.99 **Supplier** Codemasters, 1 Beaumont Business Centre, Banbury, Oxon OX16 7RT.

3D catastrophe

The great well of originality is getting pretty dry these days so Pyramide can be applauded for drawing something refreshing up.

Cats. Those furry things the Swedish like to throw. The galactic dictator called the Sphinx, has been collecting them. Presumably because he owns everything else. You, the hero of this tale, must set forth to defeat the fiend in your Space Ship (tm), all in *Elite*-style 3D.

To gain an audience, you must collect 8000 cats (squash those moggies into that hold!) or have a good hand of cards.

Collect the cards from various planets, collect the cats, fight off the bad guys, blast the Ark and meet the Sphinx, all in 3D (red and blue lines with special glasses to give the effect), to win the game.

Wanderer is very much hit and miss. Some of the 3D effects are excellent, some don't work. The poker element is quite interesting.

Popular Appeal ♦♦♦

Duncan Evans

Program *Wanderer* **Micro** Atari ST **Price** £24.95 **Supplier** Pyramide, via Rio Promotions Ltd, 28 Waverly Grove, London N3 3PX.

Adventuring with some added incentive

Tony Bridge examines two GAC'd adventures in Incentive's Gold Medallion range

It's some while now since I started singing the praises of Incentive's *GAC*, and only a few adventures written with the utility have come my way. This is rather surprising, as *The Quill* has certainly made its impression on the adventure-writing public.

But there have been one or two commercial examples of *GAC*'d material, and now a whole series is set for release by the authors of *GAC*, Incentive. The first two Medallion Adventures to hit us unsuspecting consumers are *Apache Gold* and *Winter Wonderland* – two very evocative titles, and I'm a sucker for good titles, since they're half the battle, aren't they?

Winter Wonderland is written by Tim Walsha and Simon Lipscombe and, with the recent weather, is rather a good one to be playing at the moment. I hope the required atmosphere will be evoked in the middle of August! It stands a good chance, though, because right from the start the all-pervading cold makes itself felt – you are cast in the role of an anthropologist who is summoned by an old friend to share a discovery in Tibet. It's no less than Shangri-La, the fabled lost civilisation, so of course you must join him.

Unfortunately, your plane crashes in the Himalayas, and you are now lost in the snow.

The graphics created are not bad at all, with a frame around each picture and a good frosty feeling to each one.

You can wander around your crashed plane a bit, and the first puzzle is depressingly simple and hardly worth the trouble – as long as you have found the flare gun, the bear is no problem at all, and his demise will allow you into the interesting bit of the game, Shangri-La. Now things warm up in more than one way, as locations galore are discovered (including a health shop – in Shangri-La?).

The scenario is interesting, and the atmosphere sustained very well, with boys throwing snowballs at you, skiers walking by, shoppers bustling past, ticket collectors frowning at you (until you find the credit card that is) and more. What's more, the pictures are good, well drawn, each one being nicely framed with a suitably wintry motif.

The puzzles that I've come across so far haven't been particularly brain-stretching and the uses to which you must put objects are obvious in most

cases. In fact, you'll find that you stumble across the correct solution to problems almost by sheer luck. For example, a snowdrift blocks the way near the beginning, and *Dig* was the first and correct response. Of course, things aren't always such plain sailing, witness the ski pass encased in ice and an icicle which melts once you've carried it for a certain length of time.

In a way, I'm all for a nice easy tramp around an interesting landscape, but I find this one just a little too bland at the start, despite the atmospheric touches.

However, I certainly want to keep bashing away because I want to see just what is on that inaccessible (for now) ledge – I want to see what the icicle does – and I want to know, among other things, what is in the crevasse. That's the mark of a good story, I suppose, that you should want to keep coming back to it.

The second adventure in the Medallion series, *Apache Gold*, ■ by a favourite writer of mine, Pete Torrance – you'll know his name from the other best-sellers of his, *Subsunk* and *Seabase Delta*. These two were smashing stories and all the better for being budget titles. They were also both written with *The Quill* – Torrance is certainly giving the utilities a bashing!

His new opus displays much of the wry humour and weird problems that characterised the previous programs, and is consequently as enjoyable as those.

The title gives away much of the story, and you will get no prizes for guessing that you will be cast in the role of a cowboy (Luke Warme, which is almost excruciating as Ed Lines of the *Subsunk* saga) in search of Indian gold, and so ■

turns out to be.

Not only were the puzzles and atmosphere well drawn in Torrance's earlier efforts, but so were the pictures, and this is true of *Apache Gold* – they're a little slow to draw, being full of detail, but the *Word* command makes things quicker (its opposite, *Pictures*, reveals the graphics in all their glory).

Again, asking for help gives just the right amount of nudge to the correct solution – actually, *Help* gives the universal response *Try examining things, pardner;* but acting on that advice will give you vital information about most objects.

As in *Winter Wonderland*, puzzles aren't too horrendous, and there are ■ lot of locations to be explored before a full stop is reached. The puzzles seem to come naturally out of your surroundings, with the requisite object for the solution being close at hand and rather obvious.

To start, you must feed the horse to get him awake and then flick the reins to get him moving – this sequence will keep you busy for a while, but not for long given all the help from the program itself, and it seems like ■ shameful waste of memory and a bit of ■ waste of time all round.

Although both programs are enjoyable and worth looking at, I feel that £7.95, although a pound or two less than the top flight games are asking at the moment, is still two or three pounds more than the true value.

For the moment, they are available for the Amstrads, and soon for the Commodore, BBC and Spectrum. A word of warning – you must physically disconnect your *Protext* Rom (and others for ■ I know) otherwise all sorts of weird things will happen.

Games: Adventure Helpline

Aftershock on Spectrum. I have completed 44%, explored the city zoo (I can't get the elephant to do anything except kill me!), sewers, underground stations all the way to the filling station. I can get no further. I've been over it three times – what have I missed? Dan A Townsend, 9002 Winding Way, Germantown, TN 38138-6625, USA.

The Pawn on Atari ST. What does the guru want? Where's the key to the tree? P Wilson, 61 St Swithin's Walk, Acomb, York.

Heroes of Karn on Amstrad. Where do you find the falcon and how do you get to it? Desmond Hart, 12 Manesfield Road, Port Ellen, Islay.

The Colour of Magic on C64. How do you get past the troll in part two? T N Branston, Hollies Farm, The Posts, Cropwell Butler, Notts NG12 3AS.

Hitchhikers' Guide to the Galaxy on PCW8256. Screen door (plus any other hints welcomed). A D Cox, Fieldhead House, Leafy Grove, Keston, Kent BR2 6AH.

Planetfall on Amstrad CPC6128. How do I get Floyd the robot to give me his elevator card? Ms Adrienne Briggs, Flat 1, 24 The Avenue, W Ealing, London W13 8LP.

Heavy on the Magick on Amstrad. How do I open the locked door? Derek Wong, 42 Ingram Road, Thornton Heath, Surrey CR4 8EB.

Smugglers Cove on Amstrad CPC464. Stuck ■ Palatian Room and need exact words to get on to pentacle. What do you do with the acid, hungry cat and pirate? Have completed and can offer help on *Red Moon, Jewels of Babylon, Heroes of Karn, Message from Andromeda, Seabase Delta, Forest at World's End* and *Warlord*. Limited help on *Mordon's Quest* and *Smugglers Cove*. Christopher Eng, 14 Amner Road, London SW11 6AA.

Three Weeks in Paradise on Amstrad CPC6128. How do you sharpen the blunt axe, if at all? How do you use the bottle and corkscrew? T Snell, 89 Sweetman's Road, Hill Farm Estate, Shaftesbury, Dorset SP7 8EH.

Questron on Atari. Where is the trumpet and how do I get it? Ian Brooker, 163 Verity Crescent, Canford Heath, Poole, Dorset BH17 7TX.

Sphinx on Electron. I can't find the boat or the mithril ring – have tugged a lot of hair up to now! Stephen Mellor, 139 Langlee Drive, Galashiels, Selkirkshire TD1 2EA.

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand.

Fill in the coupon, explaining your problem, send it to us, and a fellow adventurer may be able to help.

Remember – the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure ..... **on (Micro)** .....
Problem .....
.....
Name .....
Address .....
.....

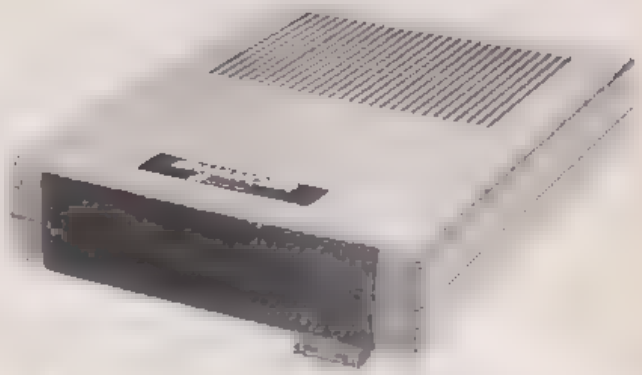
TURN YOUR CBM64 INTO A PROFESSIONAL WORD PROCESSOR

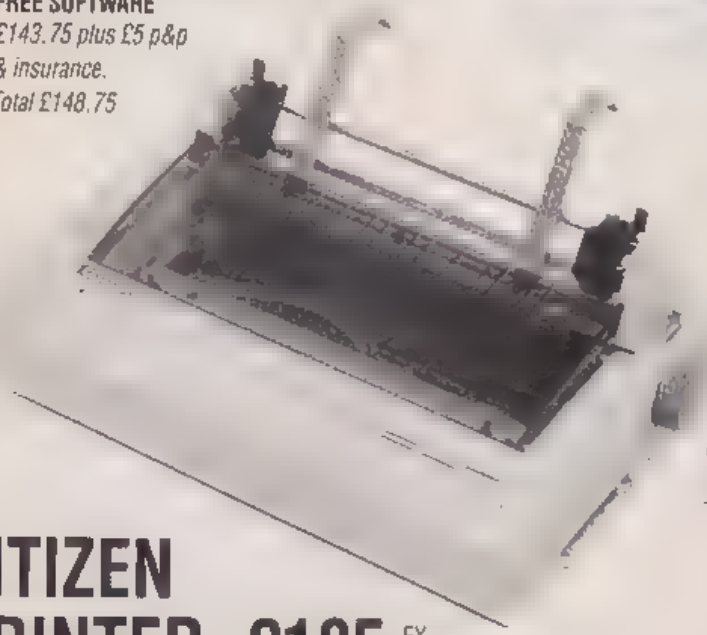
DISC DRIVE £125 EX VAT

Enhancer 2000 by Chinon
Free icon-driven word processor
Free Utility disc

"a good buy" . . . *Your Commodore*
"impressive specification . . . very good indeed" . . .
Commodore Computing International

* On sale in computer stores across the USA
* CBM64, Plus4 compatible
* Super high speed — it's fast
* 1 year warranty — it's reliable
* Does not use any computer memory — it's smart
* **FREE SOFTWARE**
* *£143.75 plus £5 p&p & insurance. Total £148.75*





BLANK DISCS £8.69 EX VAT

10 discs per box
* Double sided, double density
* Hub reinforced,
* 100% certification, 2 notches and index holes.
* *£9.99 plus £1 p&p/box. Total £10.99*

CITIZEN PRINTER £185 EX VAT

Citizen 120D . . . 120 cps draft/60 cps emphasised draft/25cps NLQ
* **includes CBM 64 interface**
* tractor feed, 4k buffer
* graphics, pica, elite, italics
* sub/superscript
* *£212.75 plus £5 p&p & insurance. Total £217.75*

WORD PROCESSOR PACKAGE GREAT DOUBLE SAVER BUY

Enhancer 2000
Citizen 120D
Word Processor **£299.00** EX VAT
Utility disc
Total incl VAT, p&p, and insurance £353.85

FIRSTLINE SOFTWARE—
Your firstline of supplies

Write for full details or phone Access 0480 213969
Cheques payable to R.E. Ltd.,
206 Great North Road, Eaton Socon, St. Neots, Cambs. PE19 3EF

POPULAR Computing WEEKLY
SPECIAL SUPPLEMENT
1987
Jan 29-Feb 4

Picture this!

Computer graphics have probably sold more machines than any other aspect of the hobby. Whether it's fast-action animation in an arcade game, the superb displays of *The Pawn*, or intriguing 3D displays from drawing and design programs, there's something about graphics that grabs the attention - and the imagination.

The evolution of personal computers can almost be tracked in the parallel development of their ability to display pictures. To start with, no graphics were possible. Computers were designed to display text only. This led some imaginative individuals to create those now-extinct pictures of Snoopy on his kennel built up of letters and numbers.

The earliest games on computers were either text-only adventures, or space games in which you attempted to shoot down a fleet of asterisks with your capital "A", while trying to dodge the hail of deadly full-stops.

The next breed of machines, like the Commodore Pet and Tandy TRS-80, supported chunky block graphics which allowed you to create very crude graphics displays, but not in colour.

The breakthrough into multi-colour, high resolution displays did not come until the price of memory fell to allow machines with more than 16K of memory. The reason for this is that graphics make great demands on memory. It works like this:

Real graphics power (above and below) from the new Apple II GS. 640 × 200 resolution, choice of 4,096 colours.

The smallest item a computer can manipulate is a bit (one eighth of a byte). So it takes one byte to handle eight dots on a screen. Computer resolution is usually discussed in terms of low (about 100x100 dots), high (250x200) and very high (currently up to around 1200x800). It can be seen that a display of 250×200 is 50,000 dots, or about 6K.

But this is only two colours because the dots can only be on (foreground colour) or off (background colour). To introduce extra colours takes even more memory. One bit has two possible values, 0 or 1. Two bits can have four values – 00, 01, 10, 11. Most computer designers have settled on 16 colours as a compromise because it allows you to store colour display information in half the memory required by the actual picture information.

From this it can be seen that computer graphics is a two-stage affair. First, your own programs, or commercial software packages, create the display in memory. Next, several times a second the computer automatically transmits the contents of this video memory to the TV or monitor.

Introduction to Computing — part three

BALL BREAKER

Coming Soon....

CRL Group PLC, CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD

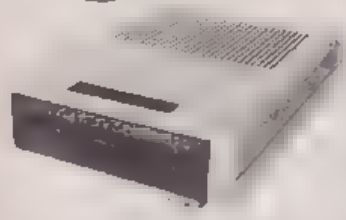
Evesham Micros

WITH NEW COMPATIBLE ROM

The EVESHAM Enhancer 2000

FOR COMMODORE COMPUTERS

The Evesham Micros' version of this reliable and compact disc drive has a **new ROM** to ensure a **very high** degree of compatibility with disc turbos and protection schemes.



FEATURES

- ★ HANDLES DISC TURBOS
- ★ DIRECT DRIVE MOTOR
- ★ NO OVERHEATING
- ★ VERY RELIABLE
- ★ 1 YEAR GUARANTEE
- ★ COMPACT SIZE
- ★ HIGHLY COMPATIBLE
- ★ VERY QUIET

IMPORTANT: ONLY THE EVESHAM MICROS' VERSION OF THIS DRIVE HAS THE NEW ROM THAT WILL HANDLE DISC TURBOS AND LOAD OVER 99% OF PROTECTED SOFTWARE.

THREE PURCHASE OPTIONS

OPTION 1 EVESHAM ENHANCER WITH FREE DRIVE TEST SOFTWARE ONLY **£149.95**. **OPTION 2** EVESHAM ENHANCER WITH FREE DRIVE TEST SOFTWARE AND QUICKDISC+ FAST LOAD/SAVE AND DISC UTILITY CARTRIDGE. ONLY **£159.95**. **OPTION 3** EVESHAM ENHANCER WITH FREE DRIVE TEST SOFTWARE PLUS FREEZE FRAME BACK-UP/UTILITY CARTRIDGE AND 10 DISCS ONLY **£179.95**

OTHER COMMODORE EQUIPMENT

FREEZE FRAME The leading back-up cartridge for the 64/128. Transfer your tape software to disc including multi loads and programs that load in less than 40 secs. VERY easy to use. **ONLY £39.95**

QUICKDISC+ Fast LOAD/SAVE plus utility cartridge. User friendly and features reset button. **ONLY £19.95**

NEOS MOUSE/CHEESE The best mouse for 64 software on tape and disc **ONLY £42.95**

1541C DISC DRIVE . . . See Enhancer offer above **ONLY £189.95**

POWER PACK Suit 64, Vic 20 **ONLY £24.95**

CBM 64 COMPENDIUM PACK Plus joystick and 4 games. **ONLY £189.95**

CBM 64C CONNOISSEUR'S COLLECTION **ONLY £239.95**

DISK NOTCHER **£6.95**

PRINTER OFFERS

Check out these offers on top quality printers. All the models offered are substantially reduced from the normal high street prices. Prices are fully inclusive of VAT, delivery and lead to suit any computer with centronics parallel printer port, eg. Amstrad, BBC, Einstein, Atari ST, Oric, Dragon, IBM PC or compatible, Memotech or MSX. For the CBM 64/128 we supply a user port centronics cable. Spectrum or QL owners an appropriate interface is supplied for an extra £20.00. BBC & Atari models an interface is supplied for an extra £30. If you require a detailed print sample of any model please send a S.A.E. stating your requirements. Delivery is by insured recorded delivery and orders are despatched the next working day after receipt, provided we have stock.

PANASONIC KXP 1080

Now an even better price for this popular printer. A huge number of print options can be achieved, the switch selectable NLQ being available in all modes except sub/superscript. The quality of the NLQ is far better than other similarly priced printers. Features include 100 cps draft mode, 20 cps NLQ, friction and tractor feed, Epson compatibility and easy change long life ribbon.

ONLY £179.95

MICRO P. MP165

The best NLQ of any printer in the price range? Most people who see it think so. This printer has proved very, very popular over the last year and when we say at this super competitive price it has unusually high draft speed of 165 cps and its superb switch selectable NLQ at 35 cps make this the class winner for performance per pound. Standard features include friction and tractor feed, 2K buffer, Epson compatibility, quiet operation and full graphics capability. Must be the highest spec available for the price.

ONLY £219.95

STAR NL10

New high specification printer just released. All the usual features PLUS easy front panel selection of most modes, semi-automatic, single sheet feed, double and quad height characters AND plug in interface cartridges. Choose between standard centronics parallel, IBM, or Commodore. Ideal for Commodore owners who want the convenience of a CBM ready printer but may wish to change later, just buy a new interface cartridge £39.00. When reviewing this model in a group test with the Epson LX80, Citizen MSP-10E and others, What Micro magazine referred to it as "the Rolls-Royce of these printers". A single sheet feeder is available for £63.00

OUR PRICE: ONLY £259.00
(state which cartridge required)

AMSTRAD DMP 2000 **£159.00**

DAISY WHEEL PRINTERS

SPECIAL OFFER STAR POWERTYPE **£219.95**

JUKI 6100 **£289.00**

ATARI ST NEW PRICES

Atari 520 STFM (new model)	£399.95
520 STFM c/w mono monitor	£499.95
520 STFM c/w Philips col. monitor	£599.95
520 STM	£249.95
520 STM c/w SF354 Disk Drive	£379.95
1040 STF	£599.95
1040 STF c/w mono monitor	£749.95
1040 STF c/w hi-res col. monitor	£949.95

Don't forget all prices include VAT and carriage

All prices include P&P and VAT. Send cheque, Postal Order or Credit Card Number. Credit Card order accepted by phone. Callers welcome. Wide range of goods stocked. Trade enquiries welcome. Europe orders send price as advertised. Outside Europe £2.00 for airmail. Pay by order to Evesham Micros please.

EVESHAM MICROS
BRIDGE STREET, EVESHAM
WORCS WR11 4RY.
Tel: 0386 41989

MICRO CENTRE
1756 PERSHORE ROAD,
COTTERIDGE, BIRMINGHAM.
Tel: 021-458 4564

ALL OFFERS SUBJECT TO AVAILABILITY

Also note that there is a direct link between the resolution of your monitor, and the resolution supported by your computer.

The chances are that your monitor will be able to display a far higher resolution than your computer can generate. The exceptions to this general rule are the truly advanced graphics machines like the Atari ST and the Commodore Amiga which require very high resolution monitors to get the most from their display capabilities.

All this discussion of memory, bits and bytes raises another point about graphics. Simply that a high resolution display contains a large amount of information - perhaps as much as 32K or 64K by the time you include colour. So trying to animate computer graphics - ie, to move large parts of the display, or many smaller parts - requires a very fast, very powerful microprocessor. The older 8-bit processors as used in the Commodore 64, Amstrad CPC, BBC Micro and others, just aren't up to the task, which is why programs like flight simulators usually produce pictures that change in noticeable stops and starts. The STs and Amigas employ the superb 68000 processor which is much faster and can display fast-changing graphics with no noticeable jerking.

As a way of overcoming this graphical handicap, several computer designers introduced special graphics processors to take some of the workload off the main processor. Perhaps the most successful of these is the VIC-II chip in the Commodore 64. In addition to handling colour and other graphics information, the VIC chip also provides another powerful feature - sprites.

Before we talk about sprites, we need to back-track a moment and look at character graphics - the way a computer handles text and numbers.

If you look closely at your computer screen (don't try too hard - it hurts your eyes) you'll see that each character is made up of a series of dots, usually on an 8×8 grid. It would

'CAD programs allow you to perform actions like 3D rotations'

obviously be wasteful if the computer had to create the characters individually each time, since they don't change.

Computer designers quickly determined that the most efficient way to handle this was to build in a fixed character set which contained the definitions for each character: the letters A to Z, numbers and symbols like *, £, #, @ and so on.

The catch with doing things this way is that because the characters are built in, they can't be changed. So the next step was to allow users (that's you) to copy the characters into RAM memory where they can be altered. The ability to support user-defined characters is a very useful one. It means that you can design atmospheric texts, or build up other graphics characters by redefining existing ones.

Useful though this is, it has one drawback for animated characters - the computer puts characters into fixed spaces, ie the first 8×8 dots in the top left corner of the screen are one character space, the next 8×8 dots are the second, and so on. Creating an illusion of movement involves displaying a character, erasing it, displaying in a slightly different position. But with character graphics, the smallest movement is eight dots, so the animation looks jerky.

Now with sprites, the computer can move them as little as one dot at a time, giving a very smooth animated effect. And because the computer can handle sprites automatically, you can also create other effects like putting sprites in front of, or behind, other characters, as well as detecting collisions between sprites.

The same techniques have been employed on the Amiga and the ST, so that not only do they have the benefit of the faster processor, but because their graphics chips are equally advanced they can handle more and bigger sprites.

But whatever computer you own, you will very quickly come to the realisation that programming in Basic is completely inadequate for all but the simplest graphics exercises. Basic simply isn't fast enough to manipulate all the information required.

So you have two choices: either program in a faster language, either machine code, or one of the compiled languages like Pascal or C; or use commercial graphics software.

It isn't worthwhile going into graphics programming here since every computer uses different commands, or stores graphics data in different places in memory. You must resort to your manual, or one of the many programming books available for nearly every computer, to learn how to manipulate graphics in programming, and to find a good memory map - essential for learning where your computer stores its displays, colour, sprites etc.

However, we can take a quick look at some of the many kinds of graphics software packages available.

Paint programs

There is a paint program available for just about every machine on the market. Often your problem will be choosing amongst the many at your disposal.

Most of these provide a number of graphics tools to help you create an image. These include pens for fine line drawing, brushes for thicker strokes, box and circle tools to create these items quickly and easily, and both colour and pattern fills which allow you to "paint" large areas. You should also look for a zoom, or magnify function, which allows you to enlarge a section of the screen for detailed work.

Other useful features are the ability to undo your last action, rotate items, add text, and - more essentially - the ability to load and save pictures to tape or disc, and to print out your designs on paper.

You should note that care is needed when creating a design for printing because 90 per cent of printers only work in black and white. The printing process can make a terrible mess of your design when all your colourful work gets rendered in shades of grey.

Draw programs

Several computers support what are called "draw" programs, which differ from paint packages in that they are really designed for more technical graphics work - producing

'Programming in Basic is inadequate for all but the simplest graphics'

accurate technical designs, maps, architectural plans and so on.

Some of the tools are the same: pens, brushes, boxes and circles, zoom, and pattern fills. Often they don't support colour because it is always intended that the designs should be printed out and colour support is of questionable value.

CAD programs

Computer-aided design software is a highly developed form of the draw program (or rather the reverse - draw programs are simplified CAD packages; CAD was there first). The main differences are the degree of accuracy the software provides, and the fact that CAD software almost always features three-dimensional manipulation of objects.

For example, with a draw program, you can create a design which looks three-dimensional because of clever use of perspective. But it remains a two-dimensional drawing. A CAD program will store your design as a series of 3D co-ordinates. This allows you to perform actions like 3D rotations, and to look at the design from different angles.

Animation programs

These packages work in similar fashion to paint programs in so far as creating designs goes. However, the bonus is that you can then animate the finished product.

The method is identical to that used in film animation, you create a series of frames. The computer then displays these frames in rapid succession allowing you to create your own short cartoon sequences. The snag is that animation, as we've already seen, is very expensive in terms of memory - you're creating not one picture but many.

So, although there are animation programs for machines like the Spectrum and the C64, this kind of software really requires an ST or an Amiga to show off its talents to full effect.

Comms: The Baud's

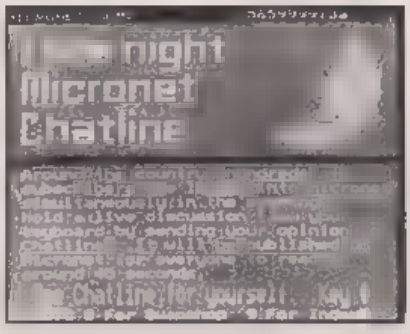
Communications has not traditionally been a major area of concern either for micro users or for manufacturers. Many of the bread and butter home computers sell in volume despite the fact that they lack an RS232 interface, which is essential for comms, and many of the people whose micros do have this facility find that they seldom, if ever, use it.

Despite this there's a small but growing community of micro owners who are committed to comms, and technological advances are likely to trigger a more dramatic expansion over the next few years. In the meantime you may feel that you want to experiment in the field, and that it's worth finding out more about it.

Currently the form of computer-to-computer communications is dictated by the nature of the technology. Computers are digital, so their input has to be boiled down to a series of digits

that are either off or on, while the world in general and telephone lines in particular are analogue, a value can be anywhere on a continuous scale. So in order to understand the outside world a computer needs to have sound, light or whatever translated into a series of numbers.

An RS232 port is crucial to this process, because it allows you, through the computer's software, to control the rate of flow and nature of digital data received by the port. If you connect two computers directly communication is then simply a matter of synchronising the two RS232s, as the data will be sent in digital form and received in digital form (typically this sort of setup, or a development of it, will be used in a local area network) but for wider-



range communications you'll almost certainly need a phone line.

Unfortunately, the telephone system isn't geared to data communications, so if you're sending digital information down a phone line you have to convert it to a sound signal first, and then at the other end it has to be converted back to digital. In order to do this you need to place a modem, or "modulator/demodulator" between the computer and the telephone. And that's where the fun begins.

Baud rates

Data transfer rates can vary, depending on the sophistication of the modem and the purpose for which it's designed, so the first thing you need to do is synchronise your sending rate (measured in baud, or bits per second) with that of the receiving device at the other end. The most commonly used baud rates are 1200/75, 300/300 and 1200/1200, 1200/75 being the split baud rate used by Prestel and similar services. It may seem illogical for one end of a communications setup to be sending at 1200 baud while the other sends at 75, but actually it's quite sensible in this case. Prestel and its rivals are basically menu driven systems where you move through a series of screens of information by inputting a series of keystrokes. The keystrokes are sent at 75, while the screens come back at 1200, so actually it's a very economical way of using telephone time.

But this economy only applies if you want to use Prestel in the way it was designed, as an information provider. If on the other hand you want to send substantial quantities of information yourself you'll find it a protracted business at 1200/75, and that's where 300/300 and 1200/1200 come in. It's quite easy to categorise modems operating at these rates, 300/300 is (obviously) slower but more reliable, while 1200/1200 is more expensive and theoretically faster, although the limitations of BT's phone lines can often introduce enough errors to make the latter advantage debatable.

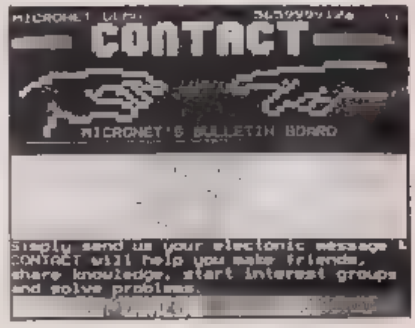
RS232 ports will generally have the ability to operate beyond these speeds, often going up to 19200 baud, but although 2400/2400 is starting to become available higher speeds will have to wait for improvements both to the phone lines and to error-checking protocols.

In the meanwhile current protocols can be quite confusing enough, although fortunately you can usually get by just by being able to set them rather than having to understand them. The three major such parameters are word length, parity and stop bits. Word length sets the number of bits in each character (usually seven or eight), parity determines whether or not an extra bit is inserted with each character to check for transmission errors, while stop bits sets the number of bits at the end of each character.

Most communications software, however, has simple facilities allowing you to set these and other protocols, so it's generally simply a matter of setting them up for the communications systems you want to use, then forgetting all about them.

A few computers will come with basic facilities for controlling the RS232 port, and at a pinch these can sometimes be used for communications, but generally you'll want purpose-built communications software. Some integrated software packages for business machines include a communications module, but otherwise comms software is sold as a separate package or bundled with a modem, and comes in varying degrees of sophistication.

When you're buying comms software it's worth doing a certain amount of research first, as you could find the software you've bought is unable to access a particular system. The most common problem is probably differences



between Prestel-type frame-by-frame software and scrolling bulletin board software. In the latter information is sent a line at a time, and simply scrolls up the screen, so you can have some interesting, if ultimately illegible, results if you try to mix the two.

Autodial

Comms software can also include frills of varying usefulness, such as autodial and autoanswer. An autodial facility does make life a little easier if your modem will support it, and can sometimes be combined with a phone directory that allows you to dial and log-on with a minimum of keystrokes. Autoanswer is less useful for most people, but if you want to

Tale

operate your own bulletin board, or for some reason to have your micro answer the phone while you're out, it's vital.

Once you've got all this sorted out, what exactly should you use computer communications for? Ultimately, say the pundits, we'll all be using comms to send letters to each other rather than using the boring old mail service, but in the shorter term most modems are likely to be employed in hooking people up to Prestel or to electronic mail services.

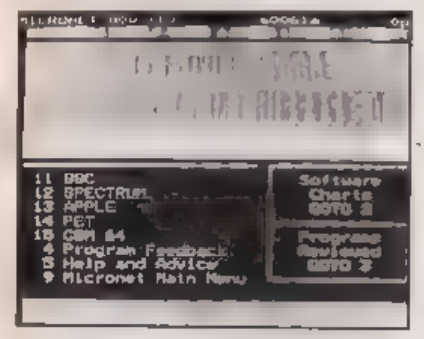
Prestel has the virtue of being relatively cheap and easy to understand and offers the most comprehensive range of services.

Some of these are designed to allow Prestel to operate as a kind of electronic newspaper/magazine, so you can get screens of news, weather, travel information, and so on.

Of more interest to computer-users is a section called Micronet, which has news and reviews of developments in the computer industry, as well as sub-sections for owners of specific machines.

Commodore owners have their own Micronet-type service called Compunet, which offers the same kind of services

Perhaps the best reason to subscribe to these services is the club-like feel they have, and the benefits that accrue from this. For example, you can download software from these services which gives you a very cheap



source of music, graphics, utility and games programs, and the quality is often very high.

You can also send electronic mail to other subscribers – handy if you are experiencing programming or hardware problems. In some cases this correspondence can take the form of real-time, electronic conversations.

Another important reason for "going on-line" is the ability to play MUGs, or multi-user games. These are usually adventure or strategy-type games in which you compete with other computer users around the country (or even in other countries). The best-known of these is MUD, the multi-user dungeon, but others are being introduced all the time.

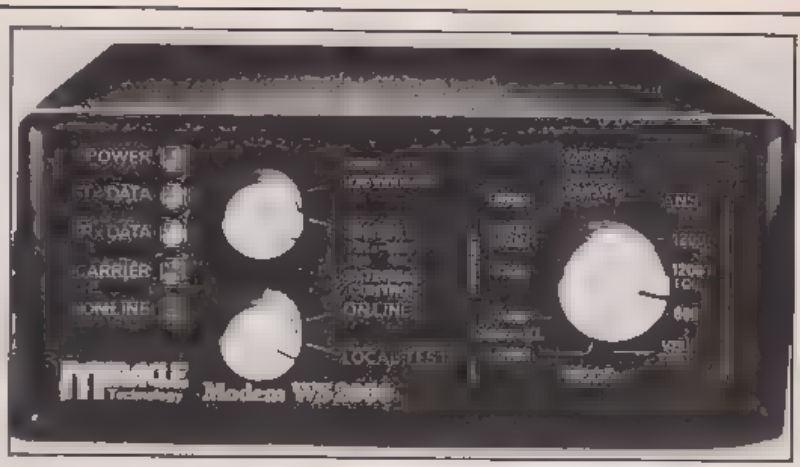
For more serious-minded users, there are dedicated electronic mail services such as Telecom Gold, One-To-One and Easylink. These are designed as faster replacements for traditional paper mail, but their usefulness is limited by the fact that very few people actually have subscriptions.

Worth trying if you're really interested, or if your company (or any other group) needs really fast communication facilities.

The third option, and the cheapest because they're free, are the dozens of bulletin boards around the country. These offer some of the same facilities as Micronet and Prestel, but on a much smaller scale.

They are run by enthusiasts and usually confine themselves to programming tricks and tips, industry gossip, dubious humour, and downloadable software. The best are truly excellent sources of information and entertainment and are free except for phone costs.

In short, there's a world of computer users out there, and all you need to join in is a modem and some software. Watch your telephone bills, though.



Modems come in all shapes and sizes, supporting a variety of features, transmission rates and bits of gimmickry. The Miracle Technology WS2000, above, was one of the early leaders in the field.

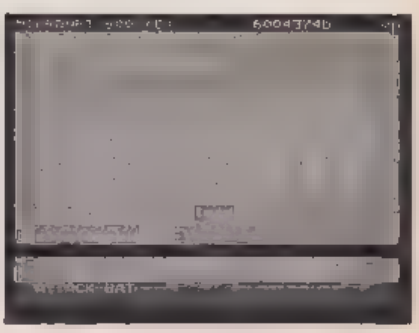
Although it's now several years old, it demonstrates many of the features you can expect from more modern devices.

Working from left to right, you can see a row of lights which indicate various actions available to the modem. Tx Data and Rx Data are common abbreviations for transmit and receive, respectively. Carrier indicates that the modem has identified a carrier signal which is put out by other electronic equipment – if you don't get this you've probably got a human on the other end of the line. On-line indicates that the modem has established contact with anoter computer.

The upper of the two dials in the middle of the panel controls the two most common transmission set-ups: 1200/75 for Prestel and similar services, and 300/300 for bulletin boards and some electronic mail services. The lower dial switches between test mode and on-line.

The larger dial on the right allows more precise control of the modem operation, and would commonly be used in for direct micro-to-micro communications. The letters CCITT at top indicate European standard protocols, while Bell indicates US standards. ORIG and ANS stand for originate and answer, other terms for transmit and receive.

Modems: the key to comms



Are ya ready to roll?

Once you've grasped the basics and you have an idea for a program, you're faced with the problem of where to start. At this point you shouldn't even turn your computer on, let alone begin typing, as you will rapidly lose track of which sections do what, and what all the variables are for.

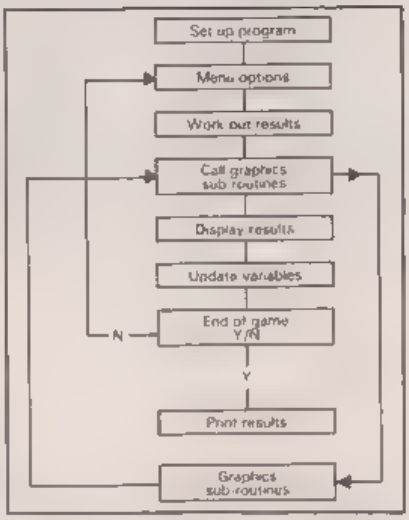
The first thing to do is plan, as exactly as you can, what the objective of the program is and how it will go about doing it. The more information you can get down on paper at this stage the easier the writing of the program becomes, and the easier it is to debug when all typed in.

While at the planning stage, pay some attention to what the display will look like ■ the finished version. A clear, easy-to-follow display with a few graphic frills is usually best for non-games programs, while making games software look as attractive as possible stands more chance of capturing the players' imagination.

Getting out the graph paper now and marking out exactly where items of information are supposed to appear will save a lot of trial and error later.

Another useful item to have on paper is a rough chart of the flow of the program. That is, what order the various sections of the program are executed in, and where the major loops occur. Take for example the Superbowl listing we've run over the past couple of weeks; below is the rough chart of its flow.

Declare variables and set up display
Main menu options
Work out results of options
Call graphic subroutines and display results
Book keeping routines. If not end of game goto main menu
Print results



Having some sort of flow diagram also helps in the actual programming as you know roughly in what order to lay things out.

Now you can begin to organise a list of specific variables, preferably giving them meaningful names, and allocate a few general variables (for use in statements like *A&=Inkey$*, for example) for temporary use where needed, and then it's programming time.

The variables should be defined at the beginning of a program, or in a subroutine that is called at the beginning. If you do put the variables ■ the start then it's a good idea to start the main flow of the program on line 500 or 1000. This way it's fairly easy to fit new variables into the front of the program when you discover you need them . . . and you always will.

Advisable

As you slowly build up the program the points made last week about structured programming should be born in mind. Any section which is used more than once in the running of the program should be considered fair game for turning into a subroutine. It's advisable to use *Rem* statements to mark where a block starts as it makes reading a program much easier. You can always delete them when the product is finished.

While commencing a program can be arduous, it really does pale in comparison when compared with the chore awaiting when everything has been typed in. Debugging.

This is where you find out that not only do some things not work at all, but others don't work the way you imagined they would. If there's a golden rule of programming then it's this, 'No program ever works correctly the first time you run it'.

Rooting out the bugs can be enormously frustrating, and it's here that having everything down ■ paper (including a program listing if you have a printer) bears fruit as it all helps you understand what is going on. When something does go wrong you should have some idea about where to start looking for the problem.

Usually it involves something you've overlooked, so if your program ■ intelligently laid out you can more easily fit in the extra lines.

A final point worth mentioning is that no program is ever truly finished. A few weeks after completion you'll suddenly get an idea on how the presentation can be improved, or how it would be a great idea if a certain feature was added. You can go on forever, or until you run out of memory but ■ time presses you have to draw the line somewhere.

Now, a telephone database program for all micros to type ■ and study, and maybe improve yourself. Note that, as two weeks ago, if you see a list of machines after a Rem statement on a line and your computer is not mentioned, then don't type it in.

The program is menu driven and offers the facility to add or delete records and display the requested telephone number.

```
10 DIM A$(100):DIM T$(100):REM DEC ST CS4
20 DIM A$(100,40),T$(100,16):REM SPECTRUM
100 CLS:REM BBC CPC ST SPECTRUM
110 PRINT"[redacted]":REM CS4
120 PRINT TAB(8,3);:REM BBC ST
130 LOCATE 8,3:REM CPC
140 PRINT AT 3,8 :REM SPECTRUM
150 PRINT "TELEPHONE DIRECTORY"
160 PRINT:PRINT:PRINT
170 PRINT "1.     LOAD OLD FILE"
180 PRINT "2.     SAVE CURRENT FILE"
190 PRINT "3.     ADD NAMES"
200 PRINT "4.     DELETE NAMES"
210 PRINT "5.     DISPLAY NUMBER"
220 PRINT:PRINT:PRINT "     SELECT 1 TO 5"
230 INPUT A
240 IF A<1 AND A>5 THEN GOTO 230
250 IF A=1 THEN GOSUB 1000
260 IF A=2 THEN GOSUB 2000
270 IF A=3 THEN GOSUB 3000
280 IF A=4 THEN GOSUB 4000
290 IF A=5 THEN GOSUB 5000
300 GOTO 100
1000 INPUT "ENTER FILENAME ";F$
1010 X=OPENIN(F$):REM BBC
1020 OPENIN F$:REM CPC
1030 OPEN 1,0,1,F$:REM C64
```

THREE GREAT PROGRAMMES FROM ASIRUS SOFTWARE

POOLSMASTER

GUARANTEED WINS ★ GUARANTEED WINS ★ GUARANTEED WINS

ASIRUS SOFTWARE presents the most significant [illegible] for the Commodore 64 computer. [illegible] POOLSMASTER [illegible] FOR MANUAL MANAGING OF [illegible] DATA [illegible] Overseas customers please send [illegible] POOLSMASTER [illegible] Amstrads [illegible] Spectrums [illegible] Commodore 64 [illegible] ALL YEAR ROUND [illegible] The program is supplied [illegible] POOLSMASTER [illegible] SAVE and RELOAD your coupons in just MINUTES [illegible] £9.50

GUARANTEE

ASIRUS SOFTWARE guarantees that POOLSMASTER [illegible] within 7 days [illegible] POOLSMASTER [illegible] (£9.50 refund)

PLOT THE BALL

ANOTHER FIRST FROM ASIRUS

[illegible] PLOT THE BALL [illegible] Spectrum 48K [illegible] Commodore 64 [illegible] SCREEN [illegible] £5.50

NOTE: With every PLOT THE BALL [illegible] ARMCHAIR [illegible] WORLDWIDE [illegible]

ASIRUS SETTLER

THE FIRST COMPLETE RACING PROGRAM

ASIRUS SOFTWARE [illegible] RACING [illegible] HORSE RACING [illegible] FLAT RACING [illegible] HANDICAP [illegible] Spectrum 48K [illegible] Commodore 64 [illegible] GREYHOUND SIMULATOR [illegible] SPEED [illegible] RACES [illegible] Each type of RACE can be [illegible] SETTLER [illegible] SETTLE SMALL and MEDIUM [illegible] STAKE and S.P. No need to [illegible] WINNING PERCENTAGE [illegible] SETTLER [illegible] £7.50

I enclose cheque/P.O. for £

NAME

ADDRESS

Computer

Postcode

PLEASE SEND ME (tick ✓)
(All programmes supplied on cassette)
POOLSMASTER available for all Spectrums
Amstrads CPC's & Commodore 64s, 128
PLOT THE BALL available for all Spectrums
Amstrads & CPC's only
ASIRUS SETTLER available for all Spectrums
Amstrads & CPC's only

P.O. CHEQUES PAYABLE TO ASIRUS SOFTWARE (PRICE INC. POST & PACKING)

ASIRUS SOFTWARE
54 DOVERHOUSE ROAD, PUTNEY, LONDON SW15 6AU TEL: 01-878 2641

CUT PRICE SOFTWARE

SPECTRUM	RRP	OUR
The Staff	7.95	5.50
Knight Rider	7.95	5.50
Green Beret	7.95	5.50
Kung Fu Master	7.95	5.50
Heartland	9.95	8.95
Paperboy	7.95	5.50
Bobby Bearing	7.95	5.50
Mikie Vice	7.95	5.50
Price of Magick	9.95	8.95
Stainless Steel	9.95	8.50
Jack the Nipper	7.95	5.50
Laser Squad	14.95	10.95
W.A.R.	7.95	5.50
Ghosts 'n Goblins	7.95	5.50
Ace	9.95	7.25
Nightmare Rally	7.95	5.50
Cobra	7.95	5.50
Dan Dare	9.95	8.95
Konami's Tennis	7.95	5.50
PYRACHE	[illegible]	8.95
Starquake	[illegible]	5.50
Turbo Esprit	9.95	6.50
Trivial Pursuit	14.95	10.95
Gyroscope Gen 2	7.95	5.50

COMMODORE 64/128	CASS	DISK
Hollywood	7.25	10.95
Bombjack	9.95	10.00
Knight Rider	8.50	10.00
Jack The Nipper	8.95	N/A
Ghosts 'n Goblins	8.95	10.95
Sold a Million 2	9.95	10.00
Paradroid	8.50	10.00
Advanced Challenger	8.50	N/A
Trivial Pursuit	10.95	14.95
Mikie Service	8.95	10.95
Sam Fox	8.50	8.50
Expert Cartridge 2	N/A	26.95
Tau Ceti	9.95	10.95
It's a KO	8.50	N/A
Price of Magick	9.95	N/A
Ex Fist 2	8.95	10.95
Knight Games	8.50	9.95
Dan Dare	8.95	N/A
Dragons Lair	8.95	10.95
Green Beret	8.50	10.00
Leaderboard	8.95	10.95
Paperboy	8.95	10.95
Mikie Vice	8.50	10.00
The Staff	5.50	N/A

AMSTRAD	CASS	DISK
Knight Games	8.50	10.95
Trivial Pursuit	10.95	15.25
Tripoint	3.50	N/A
Mikie Vice	8.50	N/A
Green Beret	8.50	10.00
Sam Fox	8.50	8.95
Way of the Tiger	8.95	10.95
Elite	11.00	17.50
Sold A Million 2	8.95	10.95
Gyroscope	8.50	N/A
Nine Princes 2	12.95	14.95
Dan Dare	8.95	N/A
Starquake 2	8.95	N/A
Monopoly	8.95	10.95
Scrabble	8.95	10.95
Atlantic Challenge	8.50	N/A
Winter Games	8.95	10.95
Tau Ceti	8.95	10.95
Paperboy	8.95	N/A
Batman	8.50	8.95
It's a KO	8.50	N/A
Y	8.50	8.95
Price of Magick	8.95	N/A

NEW SATURDAY VISA/ACCESS ORDER LINE FROM 9 to 5 Tel: 0279 24433
This is just a small selection from our stocks, please ring for more details. P&P included. Overseas orders add 75p per tape. Mail order only. Please send Cheques/PO payable to CPS. Visa & Access orders by phone welcome to:

CUT PRICE SOFTWARE
(Dept 1), Unit 6, Stort House, Riverway, Harlow, Essex CM20 2DW
Tel: 0279 24433 (24hr answerphone) or 31956 during office hours

ANCIENT & MODERN

Unit 11 (Rear), Washington Road, West Wilts Trading Estate, Westbury, Wilts

SPECTRUM	rrp £	ANM £
Crystal Castles	9.99	6.99
Cobra	7.95	4.99
Great Escape	7.95	4.99
Scooby Doo	7.95	4.99
Green Beret	7.95	4.99
Monty Mole(mr)	9.95	4.99
Death in the Sand	7.95	4.99
Spindizzy	7.95	3.99
Arkanoid	9.95	4.99
Trailblazer	9.99	3.99
Kik a Clockwise	7.95	3.99
Galaxy	7.95	3.99
Mikie Vice	7.95	3.99
Heartland	7.95	3.95
Conquestador	7.95	3.99
Shaolins Road	9.95	5.99
Trivial Pursuit	14.95	8.99
Gryphon Adv Creator	22.95	14.99
T.S.A. Mission 3	9.95	8.99
Thrantor	9.95	8.99

SPECTRUM	rrp £	ANM £
Paperboy	7.95	4.99
Top Gun	7.95	4.99
Breakthru	8.99	5.99
Masterchess	7.95	4.99
Machine Code Tutor	14.95	4.99
Johnny Red II	9.95	4.99
On the Moon	6.99	3.99
Price of Magick	9.95	4.99
Druid	7.95	4.99
Rebel Planet	7.95	4.99
COMMODORE 64		
Cobra	8.95	5.99
Light Force	8.95	6.99
Alliance's Cub	8.95	6.99
Scooby Doo	8.95	6.99
Kennedy Adv	9.95	6.99
Jet Set Willy	7.95	6.50
Bombjack Can Set	8.95	6.50
Bobby Bearing	9.95	5.99

COMMODORE 64	rrp £	ANM £
Hot Wheels	8.99	6.99
Cyrus II Chess	11.95	7.99
Ghost Toter	8.95	6.99
Alkyhat	8.95	5.99
Raptor 3	8.95	6.99
Lawyers	8.95	6.99
Arcana	[illegible]	6.99
Highlander	[illegible]	4.99
Great Escape	8.95	6.99
Crystal Castles	9.99	6.99
Samurai	9.95	6.99
Tarzan	[illegible]	6.99
Knuckleduster	[illegible]	6.99
Trivial Pursuit	14.95	8.99
Graphic Adv Creator	22.95	14.99
The Planets	[illegible]	2.99
Harvey Smith Showjumping	[illegible]	2.99
Jet Set Willy	8.95	2.99
BC Quest for Tires	7.95	2.99
BBC/Electron Exit (Acorn)	12.95	4.99
Spare D type product	*9.95*	*Code Disprice product*
Spare C16 product	*9.99*	

All prices include P & P. Overseas add 80p per tape. Please send S.A.E. for full list stating machine. Lists also available for Dragon, Atari, BBC, Electron, Commodore 16. Cheques/POs payable to

Ancient & Modern
Unit 11 (Rear), Washington Road, West Wilts Trading Estate, Westbury, Wilts

AMSTRAD CF2 3" DISKS (BOX OF 10)

RRP £49.50 — WAVE £27.00

AMSTRAD PC1512 D/D MONO

£642.85 — £600.00 (a)

AMSTRAD PC1512 D/D COLOUR

£838.35 — £765.00 (a)

ARNOR PROTEXT W/P INC. MAILMERGE AND SPELLINGCHECKER 6128/PCW

£79.95 — £55.00 (d)

HARDWARE

Amstrad PCW 8512 inc. printer monitor and software	£673.85	£513.00
DMP 2000 Printer inc. free cable for CPC	£169.99	£150.00 (b)
Alphacom 32 Printer spec./ZX81	£79.95	£35.00 (c)
Thermal Paper Alphacom 32/Timex 2040 (Box 5)	—	£7.00 (d)
Thermal Paper Sinclair ZX Printer (Box 5)	£11.85	£8.00 (d)
BBC Master 128	£499.00	£430.00 (a)
Pace PSD 3 5¼" 40/80T d/s sing. drive	£143.75	£123.00 (b)

SOFTWARE

Ashton Tate dBase II PCW	£119.00	£87.00 (d)
Sage Retrieve B128 twin/PCW	£69.99	£50.00 (d)
Caxton Card Box 6128/PCW	£59.99	£46.50 (d)
Caxton Condor 1 6128 twin/PCW	£99.99	£77.00 (d)
Camsoft Cambase PCW	£49.95	£30.00 (c)
Compact Nucleus PCW	£99.99	£68.00 (d)
Compsoft Delta 6128 twin/PCW	£89.99	£70.00 (d)
M.P.S. Kwikfile CPC	—	£10.00 (e)
Lms teach yourself locoscript PCW	£14.95	£11.50 (e)
Logicom Qmail PCW	£29.95	£23.00 (d)

All prices include VAT. Please add carriage indicated as follows: (a) £5.00 (b) £4.00 (c) £3.00 (d) £2.00 (e) £1.00 (f) 50p. Despatched by return of post

W.A.V.E. (mail order)
Walney Audio Video & Electrical
3 Shearwater Crescent, Barrow-in-Furness
Cumbria LA14 3JP. Telephone: 0229 44753

virgin games

Are you a DEDICATED HACKER?
Do you have imagination and
a flair for games?
Fluent in 6502, Z80
8086, 68000 and C.

We are looking for

Experienced Programmers and Graphics Designers

Contact John Baldachin at:

VIRGIN

2–4 Vernon Yard, Portobello Road,
London W11 2DX
Telephone: 01-727 8070

Phone book

The first couple of lines in the program dimension the two arrays which are used to hold peoples names, A$, and telephone numbers, in T$.

Lines 100 to 220 clear the screen and display the options menu while line 230 waits for the user to type in the selection.

Line 240 makes sure that the input is a valid selection, while lines 250 to 290 go to the relevant subroutine.

The block of lines from 1000 to 1140 opens a user-specified file, read in the data and close the file again. Control then returns to the menu for the user to presumably manipulate.

The next block from 2000 to 2140 opens a file and saves the data currently in memory before closing the file again.

Lines 3000 to 3070 deal with adding names to the database. First the array containing the peoples' names is searched until an empty element is found. Line 3010 checks the length of each element to see whether it is empty or not. If it is, then the user is prompted to enter the name or add or press Return immediately to go back to the main menu. Assuming the user wants to continue there is a prompt for a telephone number (line 3050).

The lines from 4000 to 4050 are used to delete names and telephone numbers from a file currently held in memory. Line 4020 checks through the relevant array until either the target name is found, and then deleted, or the end of the array is reached.

Finally lines 5000 to 5060 allow the user to add names and telephone numbers to the file held in memory. After the details have been entered by the user, the program line 5030 checks through the array containing the names until a blank element is found.

This is then filled with the details entered by the user. If no spare elements are found then a warning message (line 5050) is printed.

```
1040 OPEN "I",#1,F$:REM ST
1050 LOAD F$ DATA A$():LOAD F$ DATA A$():REM SPECTRUM
1060 FOR F=1 TO 100:REM BBC CPC ST C64
1070 INPUT #1,A$(F),T$(F):REM ST C64
1080 INPUT #9,A$(F),T$(F):REM CPC
1090 INPUT #X,A$(F),T$(F):REM BBC
1100 NEXT F:REM C64 ST CPC BBC
1110 CLOSE #X:REM BBC
1120 CLOSEIN:REM CPC
1130 CLOSE 1:REM ST C64
1140 RETURN
2000 INPUT "ENTER FILENAME ",F$
2010 X=OPENOUT(F$):REM BBC
2020 OPENOUT F$:REM CPC
2030 OPEN 1,1,1,F$:REM C64
2040 OPEN "O",#1,F$,200:REM ST
2050 SAVE F$ DATA A$():SAVE F$ DATA T$():REM SPECTRUM
2060 FOR F=1 TO 100:REM CPC ST C64 BBC
2070 PRINT #X,A$(F),T$(F):REM BBC
2080 PRINT#9,A$(F),T$(F):REM CPC
2090 PRINT#1,A$(F),T$(F):REM ST C64
2100 NEXT F:REM ST C64 BBC CPC
2110 CLOSE #X:REM BBC
2120 CLOSEOUT:REM CPC
2130 CLOSE 1:REM C64 ST
2140 RETURN
3000 LET F=1
3010 IF LEN (A$(F))>0 THEN GOTO 3060
3030 INPUT "PRESS RETURN FOR MENU OR TYPE IN NAME   ";A$(F)
3040 IF A$(F)="" THEN GOTO 3070
3050 INPUT "TYPE IN PHONE NO. ";T$(F)
3060 LET F=F+1:IF F<101 THEN GOTO 3010
3070 RETURN
4000 INPUT "TYPE IN NAME ";F$
4010 LET F=1
4020 IF A$(F)=F$ THEN LET A$(F)="":LET T$(F)="":PRINT "OKAY" GOTO 4050
4030 LET F=F+1:IF F<101 THEN GOTO 4020
4040 PRINT "NO-ONE BY THAT NAME"
4050 FOR F=1 TO 100:NEXT F:RETURN
5000 INPUT "TYPE IN NAME ";F$
5010 INPUT "TYPE IN PHONE NO. ";P$
5020 LET F=1
5030 IF A$(F)="" THEN LET A$(F)=F$:LET T$(F)=P$:PRINT "OKAY":GOTO 5060
5040 LET F=F+1:IF F<101 THEN GOTO 5030
5050 PRINT "RUN OUT OF SPACE"
5060 FOR F=1 TO 100:NEXT F:RETURN
```

Superbowl

Duncan Evans

Put on your shoulder pads, it's time for part two of the *Popular* Superbowl listing. This week an explanation on the strategies involved.

Quarterback sneak is where the ball is kept by the quarterback and he sprints upfield before the defense can catch him. Good for small gains, more if the defense expects you to pass.

Rush produces medium gains unless the defense expects a rush.

Pass is the big yardage play but runs the risk of an interception and loss of possession.

Punt is normally used when it's fourth down to kick the ball upfield to safety. If the defense has a man back to receive the ball it will be returned some way.

Field goal is obviously an attempt for three points and is used when scoring a touchdown looks unlikely.

Playing the wrong sort of defense against the offense actually helps the offense gain more yardage (usually).

More notes next week including how to customise the teams ratings. Sensible people will send £2.00 to Duncan Evans, 19 Veronica Road, Balham, London SW17 8QL for a copy on cassette.

```
4100 REM Computer defense
4110 IF oplay>3 AND ball<50 THEN LET dp
lay=5: ■ SUB 5000: GO TO 6000
4120 IF oplay>3 THEN LET dplay=4: ■ SU
B 5000: GO TO 6000
4130 IF (down=1 OR down=2) AND RND*100>2
■ AND (ball<20 OR ball>80) THEN LET dpl
ay=1: GO SUB 5000: GO TO 6000
4140 IF (down=1 OR down=2) AND RND*100>2
0 AND (ball<20 OR ball>80) THEN LET dpl
ay=2: GO SUB 5000: GO TO 6000
4150 IF (down=1 OR down=2) AND RND*100>3
5 THEN LET dplay=2: GO SUB 5000: GO TO
6000
4160 IF down=1 OR down=2 THEN LET dplay
=3: GO SUB 5000: ■ TO 6000
4170 IF down=3 AND ytgo>6 AND RND*100>30
 THEN LET dplay=2: GO SUB 5000: GO TO 6
000
4180 IF down=3 AND RND*100>80 THEN LET
dplay=1: GO SUB 5000: GO TO 6000
4190 IF down=3 AND RND*100>20 THEN LET
dplay=3: GO SUB 5000: GO TO 6000
4200 IF down=3 THEN LET dplay=2: GO SUB
 5000: GO TO 6000
4210 IF ytgo<4 AND RND*100>70 THEN LET
dplay=2: GO SUB 5000: GO TO 6000
4220 IF (ball<20 OR ball>80) AND ytgo<4
THEN LET dplay=1: GO SUB 5000: ■ TO 60
00
4230 IF RND*100>20 THEN LET dplay=3: GO
 SUB 5000: GO TO 6000
4240 LET dplay=2
4250 ■ SUB 5000: ■ TO 6000
5000 REM Play influences
5010 IF oplay=1 AND dplay=1 THEN LET ch
ance=-20: LET bonus=0: LET minus=INT (RN
D*6)
5020 IF oplay=1 AND dplay=2 THEN LET ch
ance=-10: LET bonus=0: LET minus=INT (RN
D*4)
5030 IF oplay=1 AND dplay=3 THEN LET ch
ance=20: LET bonus=INT (RND*6): LET minu
s=0
5040 IF oplay=1 AND dplay=4 THEN LET ch
ance=30: LET bonus=INT (RND*6): LET minu
s=INT (RND*4)
5050 IF oplay=1 AND dplay=5 THEN LET ch
ance=50: LET bonus=INT (RND*10): LET min
us=0
5060 IF oplay=2 AND dplay=1 THEN LET ch
ance=-10: LET bonus=INT (RND*8): LET min
us=INT (RND*5)
5070 IF oplay=2 AND dplay=2 THEN LET ch
ance=-20: LET bonus=0: LET minus=INT (RN
D*6)
5080 IF oplay=2 AND dplay=3 THEN LET ch
ance=20: LET bonus=INT (RND*10): LET min
us=0
5090 IF oplay=2 AND dplay=4 THEN LET ch
ance=30: LET bonus=INT (RND*10): LET min
us=INT (RND*4)
5100 IF oplay=2 AND dplay=5 THEN LET ch
ance=50: LET bonus=INT (RND*15): LET min
us=0
5110 IF oplay=3 AND dplay=1 THEN LET ch
ance=0: LET bonus=INT (RND*25): LET minu
s=INT (RND*8)
5120 IF oplay=3 AND dplay=2 THEN LET ■
ance=15: LET bonus=INT (RND*20): LET min
us=INT (RND*4)
5130 IF oplay=3 AND dplay=3 THEN LET ch
ance=-25: LET bonus=0: LET minus=0
5140 IF oplay=3 AND dplay=4 THEN LET ch
ance=5: LET bonus=INT (RND*20): LET minu
s=INT (RND*6)
5150 IF oplay=3 AND dplay=5 THEN LET ch
ance=0: LET bonus=0: LET minus=0
5160 IF oplay=4 AND dplay=1 THEN LET ch
ance=5: LET bonus=INT (RND*25): LET minu
s=INT (RND*5)
5170 IF oplay=4 AND dplay=2 THEN LET ch
ance=20: LET bonus=INT (RND*15): LET min
us=0
5180 IF oplay=4 AND dplay=3 THEN LET ch
ance=40: LET bonus=0: LET minus=0
5190 IF oplay=4 AND dplay=4 THEN LET ch
ance=0: LET bonus=INT (RND*20): LET minu
s=INT (RND*10)
5200 IF oplay=4 AND dplay=5 THEN LET ch
ance=50: LET bonus=0: LET minus=INT (RND
*10)
5210 IF oplay=5 AND dplay=1 THEN LET ch
ance=10: LET bonus=0: LET minus=INT (RND
*10)
5220 IF oplay=5 AND dplay=2 THEN LET ■
ance=50: LET bonus=0: LET minus=INT (RND
*5)
5230 IF oplay=5 AND dplay=3 THEN LET ch
ance=50: LET bonus=0: LET minus=INT (RND
*5)
5240 IF oplay=5 AND dplay=4 THEN LET ch
ance=0: LET bonus=0: LET minus=INT (RND*
10)
5250 IF oplay=5 AND dplay=5 THEN LET ch
ance=50: LET bonus=0: LET minus=0
5260 RETURN
6000 REM Outcome of Player v computer pl
ays
6001 IF dplay=1 THEN LET cplay=cblit
6002 IF dplay=2 THEN LET cplay=cblok
6003 IF dplay=3 THEN LET cplay=cpass
6004 IF dplay=4 THEN LET cplay=cbk
6005 IF dplay=5 THEN LET cplay=25
6010 IF oplay=1 THEN LET dummy=yqbr
6020 IF oplay=2 THEN LET dummy=yrun
6030 IF oplay=3 THEN LET dummy=ypass
6040 IF oplay=4 OR oplay=5 THEN LET dum
my=yspt
6090 LET puret=0: LET chance=chance+dumm
y: IF chance<cplay THEN LET chance=chan
ce-(cplay-chance): IF chance<10 THEN LE
T chance=10
6091 IF chance>90 THEN LET chance=90
6092 ■ TO 6000+(oplay*100)
6100 IF RND*100<=chance THEN LET gain=I
NT (RND*6+bonus): ■ TO 7000
6120 LET gain=-INT (RND*6-minus): IF RND
*10<=1.5 THEN LET win=1
6130 GO TO 7000
6200 IF RND*101<=chance THEN LET gain=I
NT (RND*8+RND*8+bonus): GO TO 7000
6220 LET gain=-INT (RND*3-minus): IF RND
*10<=1.5 THEN LET win=1
6230 GO TO 7000
6300 IF RND*101<=chance THEN LET gain=I
NT (RND*10+bonus+RND*10+RND*17): GO TO 7
000
6320 LET gain=1-minus: IF RND*10<=4.5 TH
EN LET win=2
6330 GO TO 7000
6400 IF (RND*101)>chance THEN LET gain=
2-minus: LET win=4: GO TO 7000
6415 LET gain=25+INT (RND*45): LET win=3
: IF dplay=5 THEN LET puret=5+INT (RND*
50): LET win=5: LET gain=gain-puret
```

continued on page 30 ▶

Programming: Spectrum

◀ continued from page 29

```
6420 GO TO 7000
6500 IF pos=0 AND (RND*101+80-ball)<=cha
nce THEN  LET gain=100-ball: GO TO 7000
6510 IF pos=1 AND (RND*101+ball-20)<=cha
nce THEN  LET gain=ball+1: GO TO 7000
6520 LET gain=0: LET win=4
7000 REM Book keeping
7005 LET ytgo=ytgo-gain: ■ SUB graph
7010 IF pos=0 THEN  LET ball=ball+gain
7020 IF pos=1 THEN  LET ball=ball-gain
7030 OVER 1: IF ball<=0 THEN  LET ball=
1
7035 IF ball>=100 THEN  LET ball=105
7040 PAPER 4: BRIGHT 0: IF win=0 THEN ■
■ SUB (8400+oplay*100): GO TO 7100
7050 GO SUB (7900+100*win)
7060 IF pos=0 THEN  LET pos=1: LET down=
0: LET ytgo=10: GO TO 7100
7070 IF pos=1 THEN  LET down=0: LET pos=
0: LET ytgo=10
7100 PAPER 7: IF ytgo<1 AND (ball)0 AND
 ball<100) THEN  LET ytgo=10: LET down=0:
  PRINT AT 20,8; BRIGHT 1;"  FIRST DOWN
": FOR f=1 TO 100: NEXT f
7110 BRIGHT 0: IF ball<100 AND ball>0 TH
■  GO TO 7500
7120 REM scoring results
7125 LET jsc=1
7130 IF ball<1 AND pos=0 THEN  LET jsc=0
: LET cscore=cscore+2: PRINT AT 20,8; BR
IGHT 1;"! ! SAFETY ! !": LET ball=20: GO
 TO 7210
7135 IF ball>99 AND pos=1 THEN  LET jsc=
0: LET yscore=yscore+2: PRINT AT 20,8; B
RIGHT 1;"! ! SAFETY ! !": LET ball=80: G
O TO 7210
7140 IF ball>99 AND oplay<4 THEN  LET ys
core=yscore+6: GO SUB 9600: IF RND*101<y
spt THEN  LET yscore=yscore+1: GO SUB pb
lank: PRINT AT 17,10; BRIGHT 1;"Converte
d": GO TO 7170
7150 IF ball<1 AND oplay<4 THEN  LET csc
ore=cscore+6: GO SUB 9600: IF RND*101<=c
spt THEN  LET cscore=cscore+1: GO SUB pb
lank: PRINT AT 17,10; BRIGHT 1;"Converte
d": GO TO 7170
7160 IF (ball<1 OR ball>99) AND oplay<4
THEN  GO SUB pblank: PRINT AT 17,8; BRIG
HT 1;"Not converted"
```

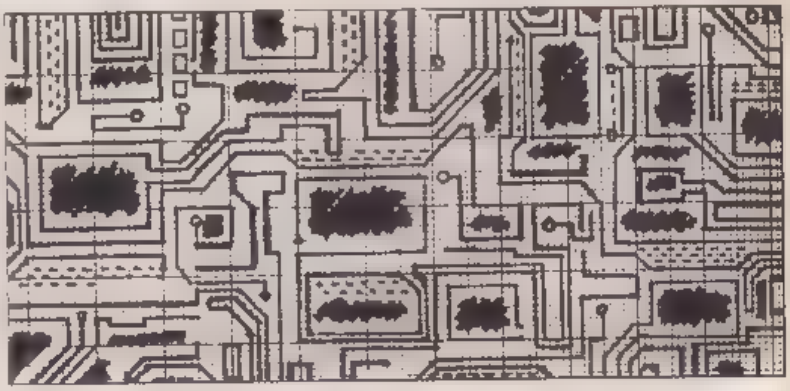
Programming: Memotech

Expand Utility

Eric Roy

The following utility for the Memotech series enables double height and double width characters to be displayed on the graphics screen. Two new commands are installed, these being, *User H"string"* for double height and *User W"string"* for double width.

It is also possible to use string variables instead of the string.



```
80 REM
100 CODE

4117 SYSTEM:  LD HL,(#FA8A)
411A          LD BC,#F5B3
411D          AND A
411E          SBC HL,BC
4120          JR NZ,SYST
4122 SYSD:    LD HL,NEWCOM
4125          LD (#F5B4),HL
4128          LD A,#C3
412A          LD (#F5B3),A
412D          LD HL,#F5B6
4130          JR SYSV
4132 SYST:    LD A,07
4134          LD (#FA88),A
4137          LD A,#C9
4139          LD (#FA87),A
413C          LD HL,NEWCOM
413F          LD (#FA8A),HL
4142          LD A,#C3
4144          LD (#FA89),A
4147          LD HL,UNDEF
414A SYSV:    LD (#FA8D),HL
414D          LD (#FABC),A
4150          RET
4151 NEWCOM:  LD A,(DE)
4152          CP "H"
4154          JR Z,DHIGH
4156          CP "W"
4158          JR Z,DWIDE
415A NAMERR:  LD A,(#FAD2)
415D          JP #FA8C
4160 DWIDE:   CALL GETSTR
4163 DW:      LD A,(HL)
4164          CALL DWO
4167          INC HL
4168          DEC BC
4169          LD A,B
416A          OR C
416B          JR NZ,DW
416D          JR PRTPOS
416F DWO:     PUSH BC
4170          PUSH DE
4171          PUSH HL
4172          CALL CHADDR
4175          PUSH DE
4176          DI
4177 DW1:     CALL GETCHR
417A          DJNZ DW1
417C          EI
417D          POP HL
417E          LD DE,CB1
4181          LD B,08
4183 DW2:     LD A,(HL)
4184          INC HL
4185          PUSH HL
4186          PUSH DE
4187          PUSH DE
4188          POP HL
4189          LD DE,13
418C          ADD HL,DE
418D          POP DE
418E          PUSH BC
418F          CALL DW3
4192          PUSH BC
```

```
4193            CALL DW3
4196            LD (HL),C
4197            POP BC
4198            LD A,C
4199            LD (DE),A
419A            INC DE
419B            POP BC
419C            POP HL
419D            DJNZ DW2
419F            CALL CR1
41A2            RST 10
41A3            DB #82,129,130
41A6            POP HL
41A7            POP DE
41A8            POP BC
41A9            RET
41AA DW3:       LD B,04
41AC            LD C,00
41AE DW4:       RLCA
41AF            PUSH AF
41B0            RL C
41B2            POP AF
41B3            RL C
41B5            DJNZ DW4
41B7            RET
41B8 PRTPOS:    LD A,(DE)
41B9            CP ","
41BB            JR NZ,PR1
41BD            RST 10
41BE            DB 09
41BF            JR PR2
41C1 PR1:       CP #3B
41C3            JR Z,PR2
41C5            CALL #001B
41C8            RET
41C9 PR2:       INC DE
41CA            RET
41CB DHIGH:     CALL GETSTR
41CE DH:        LD A,(HL)
41CF            CALL DHO
41D2            INC HL
41D3            DEC BC
41D4            LD A,B
41D5            OR C
41D6            JR NZ,DH
41D8            RST 10
41D9            DB #0A
41DA            JR PRTPOS
41DC DHO:       PUSH BC
41DD            PUSH DE
41DE            PUSH HL
41DF            CALL CHADDR
41E2            PUSH DE
41E3            DI
41E4 DH1:       CALL GETCHR
41E7            LD (DE),A
41E8            INC DE
41E9            DJNZ DH1
41EB            EI
41EC            POP HL
41ED            CALL CREATE
41F0            RST 10
41F1            DB #85
41F2            DB 129,10,8,
130,11
41F7            POP HL
41F8            POP DE
41F9            POP BC
41FA            RET
41FB CHADDR:    LD L,A
41FC            LD H,00
41FE            ADD HL,HL
41FF            ADD HL,HL
4200            ADD HL,HL
4201            LD DE,#1800
4204            ADD HL,DE
4205            LD B,08
4207            LD DE,BUFFER
420A            RET
420B GETCHR:    LD A,L
420C            OUT (02),A
420E            LD A,H
420F            OUT (02),A
4211            INC HL
4212            PUSH HL
4213            POP HL
4214            IN A,(01)
4216            LD (DE),A
4217            INC DE
4218            RET
4219 GETSTR:    INC DE
421A            CALL #3E7E
421D            PUSH DE
421E            LD HL,(#FA81)
4221            CALL #3FEC
4224            LD (#FA81),DE
4228            EX DE,HL
4229            POP DE
422A            RET
422B CREATE:    LD BC,08
422E            LD DE,CB1
4231            LDIR
4233            LD BC,08
4236            LD DE,CB2
4239            LDIR
423B CR1:       RST 10
423C            DB #8B,15,1,129
4240 CB1:       DS 08
4248            RST 10
4249            DB #8B,15,1,130
424D CB2:       DS 08
4255            RET
4256 UNDEF:     RST 28
4257            DB #26
4258 BUFFER:    DS 16
4268            RET
```


Splat

John Consadine

The following listing contains three sprite ideas. They are exclamations which can be made to appear with the action on screen to give a game added interest and impact.

Lines 1005–1015 Set up display and load data into cassette buffer.

1020 Tell machine where data is.

1030 Set colour of sprites to white.

1040 Randomises X,Y position of sprite and which one.

1042–1046 Sets parameters depending on which sprite.

1050–1060 Positions sprite and turns it on.

1070–1080 Delay then repeat.

```
1005 PRINT"■"▮POKE53281,4▮POKE53280,1
1010 V=53248
1015 FORI=0TO191▮READA▮POKE832+I,A▮NEXT
1020 FORI=0TO2▮POKE2040+I,13▮I▮NEXT
1030 FORI=0TO2▮POKEV+39+I,1▮NEXT▮REM
COLOUR
1040 X=INT(255*RND(1))▮Y=INT(190*RND(1
))▮Z=INT(3*RND(1))▮IFX<40ORY<40THEN1040
1042 IFZ=0THENS=0▮T=1▮P=1
1044 IFZ=1THENS=2▮T=3▮P=2
1046 IFZ=2THENS=4▮T=5▮P=4
1050 POKEV+S,X▮POKEV+T,Y▮REM    POSITION
SPRITE
1060 POKEV+21,P▮REM  TURN SPRITE ON
1070 FORDE=1TO600▮NEXT
1080 GOTO1040
3000 REM ***SPLAT***
3030 DATA 15,2,0,9,2,2,73
3040 DATA 2,4,72,66,8,48,162
3050 DATA 16,1,160,32,2,96,0
3060 DATA 4,8,0,0,16,31,0
3070 DATA 32,0,0,64,0,248,32
3080 DATA 192,0,17,32,0,3,32
3090 DATA 0,4,200,4,0,132,8
3100 DATA 33,6,16,32,9,32,32
```

continued on page 32 ▶

Programming: Commodore 64

◀ continued from page 31

```
3110 DATA 16,64,32,32,0,32,0
3120 DATA 0
3130 REM ***POW***
3140 DATA 130,1,0,66,0,120,34
3150 DATA 0,64,15,32,32,8,17
3160 DATA 224,3,137,0,226,68,0
3170 DATA 2,35,0,1,16,0,16
3180 DATA 144,0,40,112,127,68,0
3190 DATA 0,40,0,0,16,0,128
3200 DATA 8,32,64,4,32,32,0
3210 DATA 32,16,0,32,8,0,32
3220 DATA 4,0,32,2,0,32,1
3230 DATA 0
3240 REM ***ZAP***
3250 DATA 132,0,33,66,0,66,33
3260 DATA 8,132,16,0,8,0,0
3270 DATA 0,254,62,60,4,34,34
3280 DATA 8,34,34,16,62,62,32
3290 DATA 34,32,64,34,32,254,34
3300 DATA 32,0,0,0,0,0,16
3310 DATA 16,64,136,32,136,68,65
3320 DATA 8,34,130,8,17,4,8
3330 DATA 8,8,8,4,16,8,2
3340 DATA 8

READY.
```

Programming: Amstrad CPCs

Converter

Simon T Goodwin

This program will convert bytes in memory to a tape/disc file containing Basic data statements. This is useful for programmers who wish to display their code in a format suitable for magazine readers. Machine code programs up to 10K can be handled although this will be fairly slow. A better method is to convert code in 2K sections and then merge the programs.

```
50 :
 OPENOUT "D":MEMORY HIMEM-1:CLOSEOUT
70 DIM a$(3000)
80 MODE 1
90 INPUT "START ADDRESS",address:start=a
ddress
100 INPUT "LENGTH OF DATA",length
110 lin=1
120 WHILE address<=start+length
130 (LIN)=a$(LIN)+STR$(LIN)+" DATA "
140 FOR n=1 TO 7
150 a=(PEEK(address)):GOSUB 330
160 address=address+1
170 NEXT
180 a=(PEEK(address)):GOSUB 360
190 PRINT a$(LIN)
200 lin=lin+1
210 address=address+1
220 WEND
230 :
240 :
250 INPUT "FILENAME) ",f$
260 OPENOUT (f$)
270 FOR n=1 TO LIN STEP 1
280 PRINT #9,a$(n)
290 NEXT
300 CLOSEOUT
310 END
320 :
330 IF PEEK(address)>15 THEN b$=HEX$(PEE
K(address)):a$(LIN)=a$(LIN)+b$+",":RETUR
N
340 b$="0"+HEX$(PEEK(address)):a$(LIN)=a
$(LIN)+b$+","
350 RETURN
360 IF PEEK(address) >15 THEN b$=HEX$(PE
EK(address)):a$(LIN)=a$(LIN)+b$:RETURN
370 b$="0"+HEX$(PEEK(address)):a$(LIN)=a
$(LIN)+b$
380 RETURN
```

DON'T LEAVE YOUR FUTURE TO CHANCE

Successfully publishing software without an expensive marketing program and guaranteed European distribution became a thing of the past during 1986. This year software publishing without the strength of a brand name will become increasingly difficult. The risk elements are mounting up: advertising expenditure, U.K. and European video production, artwork design, manufacturing, stock and credit.

In re-directing those creative and development talents towards U.S. Gold's format conversions of mainline American software, Arcade conversions and license projects, you enter the no-risk area of a working association with U.S. Gold.

We have the resources to meet our financial obligations. We have an unparalleled depth of experience in understanding software development.

What other people think about us...

D.I. Weatherburn of Canvas says:

"Canvas has enjoyed a good working relationship with U.S. Gold throughout 1986 having been involved in the development of translations and arcade games such as Spectrum "Super Cycle" and "Breakthru" on three formats, "PSS" and "Arthoard"

Working with U.S. Gold provides us with a level of financial security which is hard to find in this industry and their display an understanding of the many problems of software development which is second to none."

Mike Woodruff of Adventuresoft says:

CASHFLOW *"The single most important advantage of working for a large software house such as U.S. Gold is undoubtedly the fact that cashflow can be forecast accurately. Gone are the days of worrying about how to pay the wages at the end of the month, regular payments made against work completed are the answer to all these problems."*

LICENSES *"U.S. Gold due to their enormous financial strength, are in a position to acquire the rights to the very best licensing deals and a software house who is developing products based on these licenses has a great advantage in the marketplace, especially if royalties are being payed for a successful product."*

DISTRIBUTION *"U.S. Gold's dominant position in the software market ensures maximum market penetration for our products."*

IDENTITY *"Although all distribution is done by U.S. Gold we have maintained our own identity, and have not just become another cog in the conglomerate wheel. This maintains the interest of our programmers and artists who continue right to feel that they are being dictated to by a large autonomous corporation and this in turn ensures that the standard of work is maintained."*

Charles Cecil of Paragon Programming Ltd., says:

"Having converted seven games including the number one hit 'Infiltrator', we have found them to be very good clients. The company is well organised providing considerable assistance with translations. Additionally they are one of the rare companies in this industry that are prompt with payments."

What we think about you...

We offer the most competetive rates – ARE YOU CAPABLE OF PRODUCING PRODUCTS THAT MERIT THE HIGHEST RATES?

We credit you for your work – DO YOU DESERVE CREDIT FOR YOUR WORK?

We are flexible about royalty arrangements – IS FLEXIBILITY IN PAYMENT STRUCTURES IMPORTANT TO YOU?

We care about quality – DO YOU PRODUCE QUALITY WORK?

We care about people – DO YOU CARE ABOUT LOYALTY AND COMMITTMENT?

If all your answers to the above questions are YES.....

WE ARE U.S. GOLD – TELL US WHO YOU ARE.

PROGRAM YOURSELF A GOLDEN CAREER

CONTACT: Tim Chaney or David Partington. U.S. Gold Ltd., Units 2/3 Holford Way, Holford, Birmingham B6 7AX. Tel: 021 356 3388

Keyboard Beep

Simon Parr

This program for the BBC helps avoid making mistakes in typing by giving a short beep when lower case letters are entered.

Use **Fx214,1* to shorten beep and **Fx212,216* or *232* softens it.

```
10 *K.10?&210=0:?&211=9:*FX214,1:M
20 VEC=!&210 AND &FFFF:IFVEC=&900 END
30 FORP=0 TO 2 STEP2
40 P%=&900:[OPT P
50 CMP#(ASC"a"):BCC E
60 CMP#(ASC"z"+1):BCS E
70 LDA#7:JSR &FFEE
80 .E JMP VEC
90 ]:NEXT
```

Memory Copy

A Wright

This routine for the Commodore 64 copies sections of memory from one location to another. The syntax of the command is – *Sys 49152, start address, destination address, length.*

```
0 REM MEMORY COPY
1 DATA32,107,192,141,48,192,140,41
2 DATA192,32,107,192,141,43,192,140
3 DATA44,192,32,107,192,133,250,132
4 DATA251,173,14,220,41,254,141,14
5 DATA220,165,1,41,251,133,1,173
6 DATA0,208,141,0,56,24,173,48
7 DATA192,105,1,141,48,192,144,4
8 DATA238,41,192,24,173,43,192,105
9 DATA1,141,43,192,144,3,238,44
10 DATA192,56,165,250,233,1,133,250
11 DATA176,2,198,251,165,251,208,207
12 DATA165,250,208,203,165,1,9,4
■ DATA133,1,173,14,220,9,1,141
14 DATA14,220,96,32,253,174,32,138
15 DATA173,32,247,183,165,20,164,21
■ DATA96
■ MC=49152:CK=0:FOR A=MC TO MC+120
30 READ D:POKE A,D:CK=CK+D:NEXT A
40 IF CK<>14869 THENPRINT "ERROR":STOP
50 SYS MC,53248+1024,12288,2048:POKE5327
2,(PEEK(53272)AND240)+12
```

Replace

Graham Russell

This QL function will replace ■ occurrences of ■ word, *a$*, in the string, *b$*, with the word *c$*. For example, *Print Replace$("don't","I don't read Popular","do")* will print 'I do read Popular'.

```
10 DEFine FuNction replace$(a$,b$,c$)
20 LOCal v,e$
30 v=1:v=a$ INSTR b$:IF v=0:GO TO 50
40 do_replace:GO TO 130
50 RETurn b$
60 END DEFine
70 DEFine PROCedure do_replace
80 e$=b$(1 TO v-1):e$=e$&c$
90 IF v+LEN(a$)<=LEN(b$):e$=e$&b$(v+LEN(a$) to )
100 b$=e$
110 END DEFine
```

We want your programs!!

Yes, this is your chance to get rich and famous. Well, famous anyway, as *Popular Computing Weekly* is looking for contributions to the Programming pages.

What sort of thing are we looking for? You name it – anything original from games to utilities, applications and the like, written in Basic, machine code or anything else you can think of.

Programs for any computer will be considered, not just the old faithfuls (Spectrum, Amstrad, QL, Commodore, etc), so send those listings in. What we need is a working copy of the program on tape or disc, plus an accompanying article or documentation that you would anticipate going with the piece, normally not over 2000 words.

Alternatively, send in your short programs to the Bytes and Pieces page – what could be easier?

In return, we'll pay the princely sum of £25/page for the main programming pages and £10 for each Bytes & Pieces contribution we publish. Plus the fact that your name will be indelibly carved in the *Popular* Programming Hall of Fame till time immemorial. What more could any true programmer ask?

Just send your masterpieces in to **Duncan Evans, Technical Editor, Popular Computing Weekly, 12–13 Little Newport St, London WC2 7PP** and he'll assess them post haste.

with Kenn Garroch

A danger to wildlife?

G Woods of Uxbridge, Middlesex, writes:

Q I have a Commodore 128, a 1570 disc drive, and a Commodore MPS 1000 printer. Although I am happy with the equipment, I do have one problem.

Before Christmas, I bought *Geos* to use its fonts for a local wildlife magazine I do. As you see from the example print out of *Geos* fonts, I can't get them darker or clearer and although my dealer has tried to help me I can't find a way of solving the problem.

I would like to use this system for the Easter issue of the magazine. Should I try another printer, or other software, or does my printer need to be adjusted, or does it need a new ribbon?

A From the example you have sent me (not reproduced for lack of space), it looks as though the printer driver for *Geos* is more or less copying the screen output to the printer. If you have access to a photocopier, you might try simply taking a photocopy as this will smudge the text a little making it appear more solid (you should also be able to adjust the contrast). Alternatively, print the text larger than needed and reduce it (if the photocopier will do this) in size, making all the dots closer together.

What the printer and driver should be doing is printing a line of dots that make up the text, moving the platen up and to one side very slightly, and then printing it again. It may be that the MPS 1000 cannot do this so the best thing to do would be to go to your dealer and ask him to try it with a more advanced printer – anything will do – to see what the result is.

Joystick only

M Hall of Meersbrook, Sheffield, writes:

Q I recently purchased a Comcon programmable interface for my Spectrum. It works perfectly until I plug my Alphacom 32 printer into the through port. The printer works OK but the joystick interface will only respond to down and left. Why is this and what can be done about it?

A I think the problem is that both devices are using the same control lines on the back of the Spectrum. The printer is holding two or more lines in a state (either high or low) where the Comcon expects them to be free.

The only solution is to use one device at a time and not try and use them together. Unless, of course, any other readers know of a better solution.

More chips wanted

Christopher Wates of Wakefield, West Yorkshire, writes:

Q I am interested in expanding the memory of my Amstrad CPC464 and was wondering if it is possible to replace each of the 8K memory chips with higher value chips.

Also, I would like to know if it is possible to change the Amstrad's Z80A microprocessor for a Z80B.

A The architecture of the Amstrad system (the way in which the memory is set up and the various chips interact) does not allow the expansion you suggest.

One problem is that the addressing system is geared to 8K chips and simply substituting higher capacity memory for the current system would not work, they would also probably not fit in the sockets.

Another problem is that an 8-bit microprocessor such as the Z80 can only directly access 64K of memory.

To get more, as is done with the Roms in the CPC, requires bank switching.

Bank switching is a method of substituting one section of memory with another section occupying the same address space, ie, both respond to the same addresses but only one is there at a time.

The switch is usually a bit in a memory location or output port, setting it to one switches in one option, zero the other.

A point to consider when expanding Ram is, do you really need it? Most programs that will run on an 8-bit processor such as the Z80 shouldn't need more than 64K to operate.

If they do, then a disc drive is probably of more use since it allows program sections to be overlaid by pulling them in from the drive when they are needed. With a disc drive, you also get much more permanent capacity than you would with Ram.

Concerning the change from the Z80A to the Z80B, the only difference between the two processors is that the B version is capable of running faster.

Unfortunately, the Amstrad system is geared to run at the speed set by the system clock which in turn is geared to the speed of the processor and the memory.

If you did replace the processor, you would not get any more speed from the system unless you increased the clock rate.

The upshot of all this is that unless you know what you are doing in terms of microprocessor system design, it is better to opt for a commercial add-on that will do what you require.

Looking for a games machine

Brian Hughson of Cunningsburgh, the Shetland Isles, writes:

Q I own an MSX HX-22 computer which has superb capabilities, quite easily matching the other three big un's, but there aren't very many games available.

I've now decided to keep my MSX, but also get one of the following computers, the Commodore 64 or the new Sinclair Spectrum Plus 2.

Could you please tell me which of the two I have stated is the best games only computer, which one has the best graphics, sound, and games available? Remember, I only want another computer for playing games on.

A Well, some people may disagree, but I would certainly go for the Commodore 64 as the best all round games machine of the two you have mentioned.

Its capabilities are better in all departments, plus a lot of time and effort has been put into writing some excellent games for the machine. The Spectrum Plus 2, although it is based on an old machine with a great deal of games background, has a number of new features over the older 48K models.

However, most of these have not, as yet, been used to their fullest extent.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, 12-13 Little Newport Street, London WC2H 7PP.

The musical Spectrum

Mark Jenkins with a selection of Midi programs for the Sinclair Spectrum

After our extended Atari ST orgy over the last couple of weeks we'll move on this week with some software for Spectrum users which allows you to store sounds from most Midi synthesisers and also edit sounds from the Casio CZ range.

Casio's CZ "phase distortion" synths still represent the best value for anyone entering Midi synthesis, the CZ-101 offering a compact miniature keyboard, battery power, eight-note chords with powerful professional sounds, or four different monophonic sounds played simultaneously over Midi, for around £230.

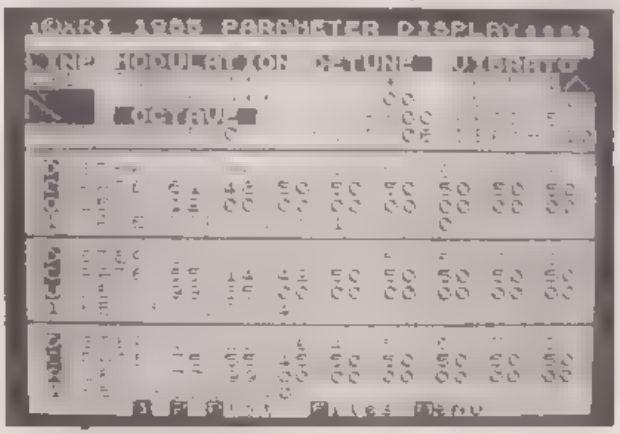
XRI's *Casio CZ Tool Kit* (£22.95) works with its Micon Midi interface and the CZ-101 or (more upmarket) the full-size CZ-1000, the splittable CZ-3000, the CZ-5000 (splittable with a sequencer) and the CZ-230S (96 presets, four programmable memories and a programmable drum machine). The *Tool Kit* doesn't work with the flagship CZ-1 since it doesn't have facilities to address its velocity and pressure sensitivity functions.

Tool Kit reads the parameters relating to the sound currently being played, but isn't able to display the parameters of sounds in its own library unless you first load them into the synth. There are four main menu options; *(D)isplay/Edit Parameters, (F)ile Sound Library, (L)oad Sound Library* and *(S)ave Sound Library*. If we go for the (D) option we see several lines listing the current waveshape, line (the order in which modulation effects are added on the synth), modulation type, octave range and so on. If you change a parameter on the synth itself the screen display will change appropriately; the CZ design incorporates two 'lines' of oscillators (DCO's), waveform modifiers (DCW's) and amplifiers (DCA's) plus effects, and the software only displays one 'line' at a time.

Each line has three envelope generators for oscillator pitch, waveform modification during the course of a sound and overall volume, and each envelope can have between five and eight stages.

By selecting *DC(O), DC(W)* or *DC(A)* you can plot out any envelope shape; the wave is plotted across the width of the screen, and the software automatically compensates for the overall length of the sound.

You can choose whether or not to wipe out the existing envelope when plotting a new one, for comparison; the envelope step number is selected using the cursor keys and the values are changed with coarse or fine resolution using the *0* key for value up and the *9* key for value down (rather a peculiar combination, almost as bad as having to use *U* for ■ *(U) to clear)*. When a new stage is plotted it's automatically sent to the synth and you can play the keyboard to hear the changed sound.



From XRI's Casio *CZ Tool Kit*

So the editing function is handy, since it's normally a complex process on the synth, but since you can only see one 'line' at a time and plot one of the six envelopes it's by no means lightning fast.

The file menu stores 128 sounds and displays their names in banks of 32 (useful since the programmable memories of the Casio synths except the CZ-1 don't allow you to enter names).

The XRI system can be a boon if you want to handle large numbers of sounds (with Casio cartridges at £50 and all but unobtainable, it's economical, too) and there are some excellent sounds in the library – fizzy basses, tinkles, fifths, metallic and noise effects. You can dump one sound or 16 sounds (starting at any point in the current display) to the synth or cartridge in a few seconds, and can also transfer the library to Microdrive and swap sounds around at will.

On to the XRI *Midi Database* (£22.95), which stores patches from any Midi synth capable of transmitting them over Midi (except the XZ range, for which XRI may be able to offer a custom database).

To use the database you have to set it up for your particular synth, which involves transmitting a patch a few times to make absolutely sure that the program knows how many bits of data are involved. You can then access the database itself, load it and save it, and print out the 'system exclusive' data involved (this may not be very useful since with some synth manuals, such as that for the Yamaha DX100, you still can't work out what bits refer to which parameters).

Sounds can be given a number, name and type, swapped around and inserted/deleted (the command ■ given as *Insect* in the manual but we'll put that one down to a misbehaving word processor) and you can search through the pages 16 sounds at a time.

You can also search for and load the first available sound of a given type, and, of course, one of the main advantages of the database is that you can name sounds from synths which don't normally offer that facility (such as the Roland Juno 106).

You can save a lot of money spent on cartridges, but you do have to make a customised copy of the software for every synth, and being tape-based the system isn't amazingly fast (microdrive would be better though).

On the whole, a pair of inexpensive, useful and straightforward programs which could do with slightly more explanatory manuals and perhaps some better choices of control functions.

XRI Systems, 10 Sunnybank Road, Wylde Green, Sutton Coldfield, W Midlands B73 5RE. Tel: 021 382 6048 (not Weds).

turbo-rom

A MAJOR ADVANCE FOR THE COMMODORE 64 AND 1541 DISK DRIVE

Totally unobtrusive in use the Cockroach TURBO-ROM plugs in in place of the normal 8K kernal ROM to immediately provide –
FAST LOAD – will load virtually ALL commercial software with speed improvements up to 600%
FAST FORMAT in 30 seconds
SCREEN DUMP even while programs running
FAST SAVE – save 3 times faster (with verify)
TURBO-ROM works with 1 or 2 drives with the printer connected (some fast loaders don't) and does not tie up the cartridge socket. The TURBO-ROM can be fitted in minutes and left permanently installed and has an extremely accessible switch to select between normal and turbo operation

ONLY £19.99 INCLUSIVE — SEND CHEQUE OR P.O. TO —

Cockroach SOFTWARE

20, THE CRESCENT, MACHEN, NEWPORT, GWENT, NP1 8ND (0633) 440434

Beware of cheap imitations

WORLDWIDE SOFTWARE

Dept 3, 1 BRIDGE STREET, GALASHIELS, SELKIRKSHIRE TD1 1SW

Commodore 64 Cass		Spectrum		Amstrad Cass	
Erebus	£6.55	Inheritance	£7.25	Top Gun	£6.55
Dragons Lair II	£7.25	Double Take	£5.75	Elektraglide	£6.55
Starglider	£10.95	Starglider	£10.95	Starglider	£10.95
Headcoach	£7.25	Top Gun	£5.75	Werner	£6.55
Star Games I	£7.25	Star Games I	£7.25	Star Games I	£7.25
Gauntlet	£7.35	Gauntlet	£6.55	Gauntlet	£7.25
Konami Coin Ops	£7.25	Konami Coin Ops	£7.25	Konami Coin Ops.	£7.25
Super Huey II	£7.25	Footballer of Year	£5.75	Sacred Armour	£6.55
Delta	£7.25	Big Trouble China	£7.25	Konami Golf	£6.55
Uridium/Paradroid	£6.55	Jewels Darkness	£11.30	Acro Jet	£7.25
Gunship	£11.20	Fist II	£6.55	Silent Service	£7.25
Shanghai	£7.25	Leaderboard	£6.55	Leaderboard	£7.25
Super Sunday	£7.25	Butch Hard Guy	£5.75	Elevator Action	£6.55
Champ Wrestling	£7.25	Silent Service	£7.25	Donkey Kong	£6.55

★★★ C64 Expert Cart With ESM Module – **£34.50** (Disk) ★★★
★★★ Special Offer – Star Games I @ **£5.99** With orders over £30 ★★★
– Commodore and Amstrad Disks are our speciality at large discounts

Phone for details all prices not published, and for further information on availability of cassettes and disks – 0896 57004

Please make cheques or postal orders payable to **WORLDWIDE SOFTWARE**.
Overseas orders, please add £1 per item for air mail postage and packaging.

VALLEY COMPUTERS ATARI SPECIALISTS IN LANCASHIRE

VALCOM LTD

18a King Street
Bacup
Lancs OL13 0AH

ATARI HARDWARE

520ST-M
520ST-FM
1040ST-F
130XE
VCS GAMES CONSOLES

ATARI SOFTWARE

A FULL RANGE OF BUSINESS SOFTWARE AND ALL GAMES ALWAYS IN STOCK. WE CAN OBTAIN SINGLE TITLES DIRECT FROM THE U.S.A.

AMSTRAD PCW8256, PCW8512, PC1512 IN STOCK

WE CARRY A LARGE STOCK OF ALL THE LATEST GAMES FOR MOST HOME COMPUTERS –
AMSTRAD CPC & PCW, C64, C16, SPECTRUM, BBC, ELECTRON, MSX, EVEN VIC20 – YES VIC20!
AND ALL ATARI COMPUTERS FROM VCS TO THE ST RANGE
A WIDE RANGE OF BOOKS AND MAGAZINES ALWAYS IN STOCK

Ring us for availability and latest prices. Our stocks change daily so call first. We accept credit card orders on 0706 874478 (24 hours)

The Valley Guild BBS on 0706 878394
300Baud 8N1 from 18:00 to 10:00 Mon–Sat and 24 Hours Sunday

For orders or just as a Bulletin Board – all the latest news about Software and Hardware releases and a Technical Query Section plus lots of Public Domain Software all Free of Charge

BALLBREAKER

Coming Soon....

CRL Group PLC, CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD

Picking up the tab

David Wallin explains how phone bills can rocket when you are using the modem, and suggests some ways of keeping costs down

The nightmare of everyone who accesses bulletin and databases must be receiving their phone bill, particularly the first one. It is quite usual for there to be a £100 to £200 a quarter increase in your bill when you use a modem and people frequently underestimate the amount the [illegible] will increase.

I know this is [illegible] subject that a number of people want to know more about, so this week we'll go into [illegible] in some detail.

There are two main ways of logging your calls, so that you can be prepared for the financial shock when it arrives: using [illegible] meter, or meticulously recording your calls.

BT will install a meter on your line for you which counts the number of units you use in each call and gives [illegible] running total.

This is useful as [illegible] you have to do is multiply the number of units by 4.4p and the result is your phone bill (excluding Vat).

The meter does not automatically reset when your bill is sent so the total is a constant running total since the meter was installed. To overcome this and enable you to time one specific call, there is also a second meter which can be reset by pushing [illegible] button, like a car tripmeter.

A meter costs about £40 to initially have installed and your line rental goes up by nearly £10 a quarter.

You cannot meter only specific calls (ie, modem ones only) unless you use the resettable meter and keep a running total on paper.

Timing your calls cuts out the cost of fitting a meter. However, while it is cheaper, it does require a bit of work.

Some pieces of communications software have built-in call timers which save you having to start and stop a stopwatch/stare at the clock all the time.

When you time your calls you must know how to calculate them; time the call, and convert the time to seconds only (ie, two minutes, 45 seconds is 165 seconds).

Then divide by the number of seconds per unit at the distance and rate involved (see table one right), eg, standard rate, distance b1 = 30 seconds per unit; 165/30 = 5.5.

If the above result is not a whole number then round it up to the next whole number (5.5 becomes 6). Multiply the result by the unit cost, currently 4.4p (excluding Vat, 5.06p including Vat). In our example, [illegible] × 4.4 = 26.4p.

How BT times your calls

When the call you dial is answered, you are charged for one unit. Simultaneously, [illegible] count-down timer starts. The time of this depends on number of seconds per unit at the distance and rate involved (see table one). When this reaches zero, you are charged for another unit and again the timer starts.

Calculating your charges

```
10 PRINT "Rate (C/S/P)"
20 INPUT rate$
30 PRINT "Distance"
40 PRINT "1) Local"
50 PRINT "2) a"
60 PRINT "3) b1"
70 PRINT "4) b"
80 PRINT "5) Republic of Ireland"
90 INPUT dist
100 IF rate$="C" THEN LET rate=0
110 IF rate$="S" THEN LET rate=5
120 IF rate$="P" THEN LET rate=10
130 LET unitposition=rate+dist
140 FOR LOOP = 1 TO unitposition
150 READ unit
160 NEXT LOOP
170 PRINT "Please enter call length"
180 INPUT "Minutes:"
190 INPUT minutes
200 PRINT "Seconds:"
210 INPUT seconds
220 LET time = (minutes * 60) + seconds
230 IF time <> INT(time) THEN
time=INT(time) +1
240 LET charge=(time/unit)*5.06
250 PRINT "Cost of call: "charge;" (inc.
Vat)"
1000 DATA 360,100,60,45,12,90,34,
5,30,24,8,60,25,7,22,5,18,0
```

Making the most of a call

Since a cheap rate local call gives you six minutes for your 4.4p, a five minute, 30 second call costs as much as a 30 second one.

If you use this knowledge wisely, whilst on-line, you can work out how much longer you have already 'paid for' and can stay on-line for longer without extra cost.

This could save £10 to £15 a quarter for the average user.

Since you are charged in advance, immediately logging off a board by manually breaking the line (hanging the modem up, turning [illegible] off, etc) does *not* save money.

It causes sysops a lot of trouble to have people constantly just breaking the line and since it is of no personal advantage to do so, on behalf of all sysops, please do not.

Charges Program

For those of you who are going to want to start timing your calls, then the short Basic program (shown left) should help you. It is [illegible] very simple Basic and should work on most micros.

Line 230 converts a non-integer (not [illegible] whole number) into an integer and may not work on some computers.

When you first use the program check the results yourself, if they don't agree then you may need to alter a few bits of the program to suit your own Basic dialect.

Table one: number of seconds given per unit for calls of various distances and at various times

	Cheap Rate	Standard Rate	Peak Rate
Local	360	90	60
Call Rate a	100	34·5	25·7
Call Rate b1	60	30	22·5
Call Rate b	45	24	18
Republic of Ireland	12	8	[illegible]

Cheap rate: Monday to Friday: 6pm–8am
Weekends: 24 hours
Standard rate: Monday to Friday: 8am–9am and 1pm–6pm
Peak rate: Monday to Friday: 9am–1pm

CLASSIFIED

Semi-display — £7 per single col. cm (+ VAT)
Lineage — 30p per word (+ VAT)

CALL SUSANNAH KING on *01-437 4343* FOR SEMI/DISPLAY ADVERTISING

SOFTWARE

★ QL SOFTWARE ★
KEEPING THE PRICES LOW

★ CHARACTER TOOLKIT £5 ★

This package contains all you need to create and use your own character sets on your QL. It also contains routines that allow you to print characters at an infinitely variable size anywhere on the screen. To help you design your characters sets we have even included a special designer program which makes it even easier.

★ ICON TOOLKIT £5 ★

This package contains all you need to turn your QL into an icon controlled super mero - takes the tedium out of typing, unlike some systems, ours is fully programmable. You can program the icons to do anything you like – you can of course redesign the icons themselves and we have even included a special designer program to make the task that bit easier.
This toolkit also contains lots of new graphics commands, all of which have the ability to draw using user defined patterns, not just solid lines. There is even a new fill command that will fill any shape with any user defined pattern (features like these are normally only to be found in the most expensive of drawing programs). We even throw in a special pattern designer so that you can design your own new patterns at leisure.
There are also 2 Epson compatible screen dumps, a print spooler and an on screen notepad.

★ GAME TOOLKIT £5 ★

This toolkit contains everything you need to create fast animated arcade games on your QL. It also contains extra routines to allow you to produce multi-tasking games (as the ones found in all the best arcade games). You can have up to 32 sprites all of which can have up to 16 frames of animation. Collision detection is also provided and of course it goes without saying that our sprites are some of the fastest and smoothest around. A sprite designer is also included.

★ COMPLETE TOOLKIT £10 ★

All these toolkits on one cartridge offering a substantial saving – probably the best toolkit ever!!!

★ SOUND EXPERIMENTER £5 ★

This is probably one of the most original and interesting packages ever written for the QL. Using this package you can turn your QL into a sort of primitive digital synthesiser. The package actually allows you to draw sounds on your QL screen and then play them back either forwards or backwards in whole or in part, so if you're at all interested in sound synthesis or you just like making silly noises then this is the package for you, and there is also a special program included to help you get better acquainted with the super basic beep command (saves hours of messing about trying to find the sound you want).

★ BLOBZ £3 ★

THE RUBBERISED ASTEROIDS GAME - ADDICTIVE ARCADE ACTION

Send cheques or P.O.s to:

SMILING SOFTWARE
10 Fir Road, Marple, Stockport SK6 7QN (89)

AMSTAT
AMSTAD STATISTICAL AND MATHEMATICAL SOFTWARE
Fully available for BOTH PCW AND CPC ranges ★★★ New Amstat !

AMSTAT 1 (v1.2!!) – means, standard deviations, variance, skewness, kurtosis, one sample, two sample, and paired t-tests, 1-way AOV with single and multiple confidence intervals, 2-way AOV, correlations, regressions, histograms, scattergrams, transformations, file storage and retrieval, output to wordprocessor file, manual. Any number of variables to a total of 500 (+) data points.
AMSTAT 2 – 27 nonparametric tests in 4 programs providing a "complete Siegel" Binomial, Chisquare (3), Kolmogorov-Smirnov (2), Runs, McNemar, Sign, Wilcoxon, Walsh, Randomisation (2), Fisher, Median (+extension), Mann-Whitney, Weld-Wolfowitz, Moses, Cochran, Friedman, Kruskal-Wallis, Contingency, Spearman, Kendall, Kendall partial, Concordance.

"tremendous value" – Tony Kendle, Popular Computing Weekly, 8–14th May 1986.

"I now give it an unreserved recommendation" – Jo Stork, Business Computing with the Amstrad, July 1986.

AMSTAT 3: FORECASTING
An array of business oriented mathematical and statistical software; Linear and Polynomial regression, Trend and Seasonal Variation, Multiple Regression Analysis, Transformations, Exponential Smoothing, Adaptive Filtering, Graphic display, full print-out, manual suited for immediate use and for teaching. *"Probably the strongest Amstrad release yet" Tony Kendle*, Popular Computing Weekly, *23–29 October, 1986.*
AMSTAT 4: RESOURCE MANAGEMENT – LINEAR PROGRAMMING MODULE
General Purpose Linear programming + Specialised Transportation and Assignment variants. Capable of analysing and solving problems of sequencing, scheduling, blending, and allocation of scarce resources. 40 page manual, 18 worked examples.
AMSTAT 6: Stanova up to 8-way analysis of variants for equal cell sizes. Unequal cell sizes on 1-way AOV. Maximum of 2,000 data points (300 on unexpanded CPM 2-2). Input for ASCII files. Output to screen or text file with full AOV table + main and interaction means and Newman Keuls on main effects. Manual (disc only).

The programs have applications in research of all kinds, education, sales, production planning, work and method study, financial planning, personnel, social work, etc.

Price list:	CPC	PCW
AMSTAT 1 v1.2	£25.95	£27.95
AMSTAT 2 v1.0	£39.95	£39.95
AMSTAT 3	£25.95	£27.95
AMSTAT 4	£25.95	£27.95
AMSTAT 6	£25.95	£27.95
AMSTAT 1+2	£49.95	£49.95
AMSTAT 1+2+3+4	£99.95	£99.95

All prices include P&P within U.K.

+ 24 hours

Cheques, P.O.s to:

S. C. COLEMAN
31 Leicester Road, Ashby-de-la-Zouch, Leics LE6 5DA. Tel: 0530 416819
(AMSTAT 1 v1.1 for the CPC still available at old price) (27)

FOR SALE

BITS & PCS

★ Computers – £30
★ BBCs, Amstrads, Electrons, 64s, Vic 20s.
★ 5¼" Disk – £4 for 10.
★ 3½" Double-sided, double density – £18.95 for 10 (boxed in plastic library cases).
Commodore 64 power pack – £18.00

Tel: 0536 516709 (125)

SPECIAL OFFER OF THE WEEK
PC1512 DDCM £838.00
FREE – 50 x 50p DISCS
Price includes VAT & delivery

*CPC 6128 (colour)	£355.00
*PCW 8512	£510.00
*PCW 8256	£407.00
DMP 2000 (printer)	£152.00
DDI 1 (disc drive)	£142.00
FDI 1 (disc drive)	£90.00
FD-2 2nd disc drive for PCW)	£126.00
10 Blank Discs (box of 10)	£20.00
RS232 (interface for 464 & 6128)	£53.00
CPS 8256 (interface for 8256)	£53.00
DK Tronics 3 V Lead	£03.00
JY-2	£9.99

(* Please add £5 for P&P.)

AMSTRAD SOFTWARE
(Software prices inc. VAT. P&P.)

Mini Office II (disc)	£14.95
Plus 'N' (disc)	£14.95
Masterfile III (disc)	£20.95
Tasword 6128 (disc)	£19.50
Protext (disc)	£19.95

AMSTRAD PC1512 SOFTWARE
(Software prices inc. VAT. P&P.)

Wordstar (word processor)	£67.00
Touch 'n' Go (tutorial)	£19.25
Supercalc 3 (sfw. spreadsheet)	£67.00
Sidekick (utility software)	£34.00
Reflex (database)	£67.00
P.C. Promise (database)	£67.00
Accountant (accounting)	£140.00

AMSTRAD PCW SOFTWARE
(Software prices inc. VAT. P&P.)

Supercalc 2	£39.95
Di Drive/Di Graph	£34.00
Tasword 8000	£19.00
Protext	£65.00
Touch 'n' Go	£19.25
Popular Accounts (Sagesoft)	£65.00
Tornadowik	£15.50
Jewels of Darkness	£15.50
Scrabble	£15.50

All Amstrad hardware and software available. Most prices include VAT. P&P.
Mail order customers please make cheques payable to:

CHILTERN COMPUTER CENTRE
100 HIGHTOWN ROAD, LUTON, BEDS LU2 0DQ (UK)
TEL: (0582) 455684 (142)

DESKTOP

10 Amsoft CF2 3" ... £29.50
5 Amsoft CF2 3" ... £15.70
10 5·25" Banana discs ... £9.95
(Suit all 5·25" drives)
All + £1.00 P.&P.
– Details of free discs! –
Desktop, 11 West Street, Hett, Co. Durham
Tel. (0388) 767244 (149)

5¼" BLANK DISCS FROM 60p
Boxed in 10's with envelopes & labels
Scotch DSDD 48TPI £11.99
Unbranded DSDD 48TPI £5.99
VAT P&P included
Money back if not satisfied
ABBATT COMPUTING CLUB, 23 FIRCROFT ROAD, LONDON SW17 7PR
Telephone 01-767 3705 (146)

PRINTER OWNERS
Save Money on Printer Ribbons
Have your ribbon re-inked at less than half the price of a new one
STANDARD PRICE
£1.75
ANY MAKE
Send your ribbon and £1.75 for fast service to
K&M COMPUTERS, 40 Fawstead, Birch Green, Skelmersdale, Lancs WN8 6RD (141)

INSTANTLY START your Digital Precision QL SUPERCHARGE Compiler
Version 1.09 to 1.19 (Bypasses Lenslock)
(Genuine Owners of Supercharge Only)
For a copy of this useful utility program, please send proof of purchase of Supercharge or Lenslock (returnable) and £9.00 (only £7.00 if you send a formatted microdrive cartridge) to:
T. D. Maxwell, 12 Vincent Rd, Croydon, Surrey CR0 6ED
Enquiries: 01-654 5730 (147)

FOR SALE

YOUR PERSONAL CENTRONICS PRINTER

- FAST 50cps GLP1/100cps GLPII
- DRAFT MATRIX PRINT
- NEAR LETTER QUALITY
- SUBSCRIPT SUPERCRIPT
- CONDENSE EMPHASISE
- 96 CHAR+48 EURO+16 MATHS
- EPSON/IBM PC COMPATIABLE (OPTION ON GLP1)

ROCK HALL
TEL (0533) 313531.

VERY LIMITED OFFER

PORTABLE FACSIMILE TRANSCEIVER FOUR ONLY HONDA FAX 2,000 – £995.00. OUR PRICE £595.00 + VAT. FIVE ONLY HONDA MAX 77 £725.00, OUR PRICE £550.00 + VAT.
THE ABOVE SOLD ON FIRST COME FIRST SOLD BASIS. NOW AVAILABLE AGAIN FOR BBC. MOULDED HIGH QUALITY CONSOLES EACH HOLDS ONE BBC COMPUTER, ONE OR TWO DISK DRIVES. ONE TV OR MONITOR AND PLACE PAD. A4 SIZE – PRICED AT £39.99. NOW ONLY £29.99. 1000S SOLD WHEN OFFERED BEFORE. CLEARANCE OF 10,000 TITLES OF SOFTWARE OLD AND NEW AT VASTLY REDUCED PRICES, PLEASE RING FOR YOUR CHOICE AND PRICE –

ROY THERSBY COMPUTERS
26–28 BOWESFIELD DRIVE
STOCKTON
CLEVELAND TS18 3EB
TEL: (0642) 604768

(1841)

★ 99p each ★

THE COMPUTER DEPOT
205 Buchanan Street,
Glasgow, G1 2JZ
041-332 3944

C64, Vic20 power supply ONLY £17.80 incl p&p

Post Free on orders over £5. Add 50p if under £5. Airmail order under £10, add £1. Send SAE for full list, state machine. Also C16/+4, BBC, Electron, C64 discs, and lots, lots more. TRADE ENQUIRIES INVITED.

Atari 800 XL / 130 XE
Essential Utilities

Transdisk Version 3.0
The most powerful tape to disc system for the Atari now exists from Software Transdisk's commercial machine code, "book" cassette games or any other software to disc. Single load, single side and now even non standard turbo tapes present no problem to Transdisk. Plus many the convenience of loading and running your newly transferred software from an options set menu. No other tape to disc utility for the Atari is as powerful + comprehensive at just £19.95 inc. Supplied on disc with instructions

The Freezer!
An amazing new utility for the Atari "Freezer" program which lets you RUN/STOP on your computer. The Freeze then takes over control and allows you to make a back-up copy of the frozen program. The back up copy will load and restart from the frozen point, on ANY Atari XL/XE computer independent of "The Freezer" Freezes most OK tape programs even those that are heavily protected it lets to use - but one key difference over programs + explains that makes a blank disc and not another key to save it - that's all £19.95 inc

Send an S.A.E. for more details or Demo utilities
Special offer order both programmes for £35.00
Make Cheques or P.O. payable to DIGICOMM and send your order to

DIGICOMM
170 Bradwell Common Boulevard, Milton Keynes, Bucks MK13 8BG. Tel: 0908 663708. (121)

BIG MONEY from your micro. Make 1987 the start of a new exciting (and profitable!) life for you. Manual (£10) gives step-by-step instructions. Send S.A.E. today for full details. Bookmark (PCW1), 14 Truro Close, Congleton CW12 3BD.

PUBLIC DOMAIN software for IBM-PC compatibles. Large selection including PC-Write, PC-File, Procomm, PC-Outline and hundreds more now available. NO MEMBERSHIP FEES. Send 18p stamp for details to: P.O. Box 164, Cardiff CF5 3YB, or tel: 0222 568924, evenings/weekends.

GENUINE opportunity for computer users to make cash working from home, converting simple data. Programming knowledge not necessary. Send large S.A.E. (specify computer) for free details to: A. O'Brien, Allan Data, 1 Lorn Road, Dunbeg, Connel, Argyll PA37 1QB. Tel: 0631 62923.

SIX CARD CRIBBAGE – Spectrum 48K/128K 100% machine code, full playing card graphics. Send £5.50 to S Software, 112 Wrington Close, Little Stoke, Bristol.

AMSTRAD PCW 8256 (upgraded to 8512 with Trimatic 1Mb 5¼ inch disc drive, DK Tronics 256Kb chips) Plus Nevada Cobol compiler, Pascal MT + compiler, carrying case. £450 the lot. Tel: 01-772 5648.

48K SPECTRUM new keyboard, Rotronics wafadrives and dot matrix programmable printer. Software manuals, interfaces and leads. Hardly used. Excellent condition. £195. For more details tel: 0959 74841 (will separate).

SPECTRUM 48K, Centronics/RS232 interface, Brother EP22 typewriter/printer, some software, £130 o.n.o. Lynx 96K (RGB/composite video/serial/light pen ports) Centronics interface, 5·25" disc drive, £160 o.n.o. Tel. Leeds (0532) 703143.

BBC B DFS plus view. Good condition only £240. AMX mouse plus software only £40. Mono monitor £40. Tel: 01-903 9838.

BBC B, OS1·2, three years old, excellent condition, with Beebmon graphics Rom, boxed, leads, books, games, cassette player, £275. Tel: 01-505 2841 after 4pm.

KILLERS eight game cassette "Kill" for only £3.50, for Spectrum 48K/128K from Karl Crawford, 90 Westfield Avenue, Redcar, Cleveland TS10 1HG.

COMMODORE printer, good condition, full colour Centronic interface, dot matrix word processor package included. £120 o.n.o. Tel: 883 0734.

COMPSWAP

TRAINING for Amstrad PC. Evenings/Weekends. Also MSDOS, PCDOS, programme training. Tel: Leeds 0532 665978.

COMMODORE 128 and 1570 disc drive, disc games, music software. Anatomy of the 128, Anatomy of the 1570 and CP/M. The Software Bus (books). £340 o.n.o. Tel: John 07918 5943 6–7pm.

ATARI ST Users tell me what a newsletter should contain – what interests you? B Wilson, 61 St Swithins Walk, Acomb, York.

SPECTRUM USERS! Curran Micro Speech. As new, unused. Several for sale at £12 each incl post. Tel: Richard 01-460 7932 evenings and weekends.

AMSTRAD CPC 6128, colour monitor, discs, books, joystick, mags, disc software, Laser Genius, Elite, "M" compiler, Way of Tiger. Only six months old, £360 o.n.o. Tel: B'ham (021) 783 4233.

BBC GAMES. Disk and tape including Trivial Pursuit (£13), Mini Office II (£8), Speech (£5), Dumpmaster (£4), Fleet Street Editor (£22) 5¼" DS/DD 85p each. Sure Shot Joysticks (£3), Replay Rom (£27). Free P&P over £10 spent. Tel: (0737) 833106 after 6pm.

COMPUTER SWAP

Computer Swap entries are limited to 30 words. All entries cost £2.50. Please enclose a cheque or postal order or give Access or Barclaycard No in the box provided. Only text appearing in the grid will be printed. Send the form to: Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

PLEASE NOTE All software offered through computer swap must be in original condition and for private sale only. No advertisements for lists of software will be accepted.

It cannot be swapped.
Warning: It is illegal to advertise pirated software.

COMPUTER SWAP

Please write your copy in capital letters on the lines below.

Name .....

Address .....

Telephone .....

☐ *Please charge my Visa/Access card no:*

FOR SALE

BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
20	7.50	7.70	7.90	8.70
50	16.00	16.20	16.90	18.50
100	29.00	30.00	31.00	35.00

- Fully inclusive (COD 65p extra)

Superior Tapes. Don't Settle for Less!

DISKS

10 5¼ DS/DD £6.50
inc plastic case
10 3½ SS/DD £16

MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER £74.00
DMX 80 PRINTER £159.00
RS232 £35.00
PASCAL ROM £35.00
SPECULATOR ROM £35.00
1 mb DISK DRIVE & INTERFACE £170
1 mb DISK DRIVE & INTERFACE £175

All the above prices are fully inclusive. We stock the entire Memotech Range. Orders/Enquiries to:

UK HOME COMPUTERS
62 CHURCHWARD AVE SWINDON
WILTS SN2 1NW
24-hr Phone Service 0703 695034 (IPU)

On instructions from M. E. Dorrington Esq. Liquidator re: "Specialized Education Software and Services Limited" (in liquidation)

FOR SALE ■ PRIVATE TREATY

Large stock of educational software programme cassettes

Further details contact ref

W. H. OSMOND TRICKS
Regents Street Auction Rooms,
Clifton, Bristol BS8 4HG
Tel (0272) 737201 (IPU)

SPECTRUM 48K transformer keyboard, monitor output, £40. Philips monitor £40, programmable joystick £10. Cartridges 50p. Software list available. Midi music interface plus composing software £50 – Roger 0252 710157

NEW! SEAL 'N' TYPE NEW!

Removable, re-washable, re-usable!

TYPE-THROUGH PROTECTIVE KEYBOARD COVER FOR AMSTRAD PC AND PCW

£7.50 plus £1.25 P&P.

Watch this space for other models patent pending, registered design

From: **KADOR**, Kilmorey Court, 279 Saint Margarets Road, Twickenham, Middlesex TW1 1PN (152)

FABRIC RIBBON RE-INKING

£1.50 per ribbon. Three for £4
Special deal for PCW printers:
ONLY £1.25 EACH!
Send ribbons and prepayment to

ALADDINK
(Dept PC) 4 Hurkur Crescent,
Exmouth, Berkshire TO14 8AP
Phone for bulk quote or special requirements
08907 50965 (150)

STOP PLAYING GAMES

Use your computer to make money. Turn your hobby into a home based income. Full and part time opportunities to cash in on this tremendous market. High earnings easily possible. Open to any amateur micro user and gamer. Write for free details.

Westlink Promotions (CR)
108 George Street
Edinburgh EH2 4LH (07)

DUPLICATION

SIMON STABLE PROMOTIONS CASSETTE DUPLICATION

Competitively priced service of DATA DUPLICATION. Comprehensive facilities includes blank or printed cassettes, inlays, labels, plays plus bar-code printing. PRICE LIST FROM

The Knightsbridge Stables
20 West End, Launton, Oxon OX6 0DF
Tel: 0869 26 2831 (73)

WOBURN ELECTRONICS

DISKXPRESS AND MAXELL DISTRIBUTORS

★DISKXPRESS IN LIBRARY CASES	10+	50+	100+
5¼" Universal	£13.90	£13.45	£13.06
5¼" SS/DD	£8.40	£8.05	£7.80
5¼" DS/DD	£9.90	£9.45	£9.10
5¼" SS/96TPI	£11.20	£10.75	£10.45
5¼" DS/96TPI	£11.20	£10.75	£10.45
5¼" DS/96TPIHD	£23.60	£22.95	£22.35
3½" SS	£16.60	£16.15	£15.75
3½" DS	£19.40	£18.85	£18.35
★MAXELL			
5¼" SS/DD	£13.30	£12.80	£12.46
5¼" DS/DD	£16.60	£16.10	£15.68
5¼" SS/96TPI	£16.60	£16.10	£15.68
5¼" DS/96TPI	£21.30	£20.10	£20.17
5¼" DS/96TPIHD	£30.20	£29.40	£28.68
3½" SS	£23.10	£22.46	£21.90
3½" DS	£33.30	£32.45	£32.00
3" SS	£38.40	£37.38	£36.60
3" DS	£30.90	£30.33	£29.70
★UNBRANDED			
5¼" SS/DD	£7.70	£7.40	£7.15
5¼" DS/DD	£9.10	£8.75	£8.45
5¼" SS/96TPI	£9.10	£8.75	£8.45
5¼" DS/96TPI	£10.50	£10.10	£9.80
5¼" DS/96TPIHD	£22.20	£21.55	£21.00
3½" SS	£16.65	£16.15	£15.75
3½" DS	£24.30	£23.60	£23.00
★SONY			
3½" SS	£23.60	£22.90	£22.35
3½" DS	£36.00	£35.10	£34.25

Buy 3 boxes get one disk free. Buy 5 boxes get 2 disks free.

Certified 100% error-free. Immediate replacement lifetime warranty. All prices per box of 10 and include VAT & P&P. Cheques and postal orders only. bulk and institutional prices available on request.

Tel: 01-950 4973

Woburn Electronics, 18 Woburn Close, Bushey, Herts. WD2 3XA

SERVICES

FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.
Our computer repair workshop has been an **OFFICIAL** Sinclair Repair Depot for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past.
Send your faulty computer **DIRECT**

SPECTRUM	**£18.75 inc parts**
ZX81	**£11.50 inc parts**
16K RAM	**£9.95 inc parts**
MICRODRIVE	**£15.95 inc parts**
INTERFACE 1-11	**£18.75 inc parts**

CALL OR SEND WITH CHEQUE OR P.O.

T.V. SERVICES OF CAMBRIDGE LTD
FRENCH'S ROAD, CAMBRIDGE CB4 3NP
Tel: 0223 311371 (3)TV

SPECIALIST COMMODORE REPAIRS

COMMODORE 64	£22.00
1541 LOGIC FAULT	£25.00
1541 ALIGNMENT	£20.00
SX64 COMPUTERS	£50.00
CBM MODEM	£18.00
COMMODORE C16	£20.00
COMMODORE +4	£20.00

OTHER COMMODORE HOME COMPUTERS AND PERIPHERALS REPAIRED ON REQUEST
TRADE ENQUIRIES WELCOME

UNITS REPAIRED BY EX. COMMODORE SENIOR TECHNICIAN WITH OVER 3 YEARS WORKING ON COMMODORE HOME PRODUCTS

TEL. 0536 69454
I. BATEMAN SPECIALIST COMPUTER REPAIRS
24 HOUR ANSWERING SERVICE. (143)

FAST COMPUTER REPAIR CENTRE – IN LONDON

*BBC Micro, Commodore, Spectrum
*Amstrad, Others
*We sell spare parts
*Used Micros bought and sold
*Eprom Programming Service

Phone: 01-863 7166

PROMPT ELECTRONICS
Unit 4, 15 Springfield Road,
Harrow, Middx HA1 1QF
(entrance in Amersham Road) (70)

SCOTLAND'S No1

for home and personal computer repairs specially fast spectrum service!

★ *Same day for most faults*
★ *1 hour if delivered personally*
★ *Free estimates*
★ *Upgrades, Membranes and P.S.U's*
★ *3 mth. warranty on work done*
★ *Open 6 days a week*

Also PRODUCTS for C and PERIPHERALS

MICRO-SERV
95 Deerdykes View
Westfield Industrial Estate
Cumbernauld
Tel: Cumbernauld 02367 37110
Trade, schools and club discount given (2) 6424

COMPUTER HIRE

TO HIRE A COMPUTER AND/OR PERIPHERALS BY THE WEEK OR MONTH RING 01-607 0157 or 01-997 6457
WE SPECIALISE IN BBC AND ALSO HAVE A RANGE OF AMSTRAD COMPUTERS FOR HIRE

COMPUTER HIRE SERVICES
294A CALEDONIAN ROAD
LONDON N1 1BA (9)

LOOK

ATARI OWNERS

Are you having difficulty finding suitable software? If so, then look no further. We have available for both hire and purchase one of the largest selections of both U.K. and American titles to choose from. Games and Utilities for all ages. Hardware and add-on devices at discount prices and special deals regularly being offered. If you would like further information please send a large s.a.e. to:—

CHAINSWORD PRODUCTS AND GAMES
[illegible]

Tel: 0509 412604

PSION ORGANISER II. Programming and interfacing to your requirements. Contact Simon Webb, 153 Faringdon Rd, Swindon, Wilts. Telecom gold mailbox: 72:MAG80001.

ATARI 520ST + dual 1 meg disk drives and monochrome monitor for sale £500 o.n.o. Telephone Simon on Brighton (0273) 730630 business hours only.

There's a Dealer near you

ESSEX

ESTUARY PERSONAL COMPUTERS

111 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ■ SEA
Tel: (0702) 614131

NOBLES
14-17 EASTERN ESPLANADE
SOUTHEND-ON-SEA, ESSEX
Tel: (0702) 63377/8

LEEDS

MICROPOWER
NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AA
Tel: (0532) 458800

LONDON

GALLERY SOFTWARE
1st FLOOR
THE ARNDALE CENT,
WANDSWORTH,
LONDON SW18
Tel: 01-870 4941

BBC software and hardware for sale. Cumana touch pad £30 o.n.o. Forth cassette and book ■■. Graphics Rom £12. Knight Lore £3. Alien ■ £3. Harrier Attack £3. Tel: 0842 3077

ATARI 1040 STF with colour monitor and mouse, excellent condition, still with ■ months guarantee and £400 worth of brilliant software. Cost

SWAP CPC 464, colour monitor. £400+ software, hardware, mags, books, for CPC 664, colour monitor + any software, hardware. Must be in very good condition. Tel: Chris (Wales) 0924 828222 ext 2210 daytime

CBM 64: 22 games for sale inc. Uridium, Paradroid, 1942, Parallax, etc., worth over £200, only £80. Also C128 Rocky Horror (disc) £8. Write: D. Huntley, 43 Fullwood Avenue, Newhaven, East Sussex.

GLASGOW

THE COMPUTER DEPOT
205 BUCHANAN STREET
GLASGOW G1 2JZ
Tel: (041) 332 3944

MEGABYTE COMPUTER CENTRE
12 ETTRICK SQUARE
CUMBERNAULD
G67 1ND

DEALERS IN	AMSTRAD
BONDWELL PC	AMSTRAD PCW
AMSTRAD PC 1512	SINCLAIR
AMIGA	COMMODORE
ATARI ST	ATARI

GLASGOW COMPUTER CENTRE
Specialists in Acorn and Atari ST Computers
VIRGINIA GALLERIES
(1st FLOOR)
33 VIRGINIA STREET
GLASGOW G1 1TU
TEL: 041-552 1522

LIVERPOOL

Microbyte
We talk business, not bits & bytes
NO. 1 ON MERSEYSIDE FOR
ATARI AND AMSTRAD
71 SEAVIEW ROAD, WALLASEY,
MERSEYSIDE L45 4QW
(051) 630 6933/638 1420
10 am – 6 pm
MAIL ORDER
SERVICE AVAILABLE

PCW 8256 for sale as new, inc discs. Printer paper free to buyer. Bargain. £375 o.n.o. Tel. Gloucester 856253.

TOP COMMODORE 64 disc chart software. All original. Send S.A.E. for details to J ■ Harrison, 100 Acre Farm, Bestwood Park, Nottingham NG6 8WJ. Disc only.

COMMODORE 64, cassette, 2 joysticks, carrying case. Music Maker, various software. Simons Basic cartridge. £130 o.n.o. Tel: 01-684 4055 after 6pm.

WANTED: Looking for a CBM MPS 802 printer in good condition – boxed, with leads and manuals. Also looking for a 1541 disc drive. Tel: 01-656 6760 evenings.

QL JS Rom computer double disc drive, 5" modem, loads of original software. Send for list, prices. Also NEC colour monitor £100. Microline printer £140. Tel: Bingham White (Howard) 0604 716109.

YORKSHIRE

YORK COMPUTER CENTRE
7 STONEGATE ARCADE
YORK
Tel: (0904) 641862

BIRMINGHAM

JOIN TODAY
FREE MEMBERSHIP
DISCOUNT SOFTWARE,
HARDWARE PERIPHERALS
SLOGGER DEALER

ELECTRON
USER & SUPPORT GROUP
For Catalogue - Send S.A.E.
ALLEN JAMES COMPUTERS
831 Stratford Rd, Birmingham B11 4DA
Tel: (021) 778 5737

OLIVETTI M20 twin 320K discs, mono monitor, MS-Basic, Multiplan, Word Processor, manuals, full business system, £300. Tel: Exmouth 265301

BBC micro upgraded model A. Runs all model B software. 32K Rom, second 6522, disc interface cassette recorder, OS 1-2, Basic Z, user guides software, Roms, £200 complete. Tel: Amersham 6527

AMX Pagemaker for Amstrad 6128. Unwanted Xmas present. £30. Tel: 059 588 394

AMSTRAD CPC 464 green screen plus £300 worth ■ software inc. Elite, G.A.C., Laser Genius. Also with books. Ideal for beginner. Worth £500 – only £200. Tel: Macclesfield 24169

CBM 64 software for sale, all originals guaranteed, mostly games, some assemblers, 8 liln. 14 Stratford Drive, Aldridge, Walsall WS9 8LJ. Tel: 0922 54484

BARGAIN! Torch Z80 double disc drive, PLUS BBC B OS1-2, PLUS £400+ books, peripherals, original software including BBC Basic, Word Processor, Spreadsheet, Database, Modem, Roms Speech Unit, £790. Dbase II CPN, £90. Solidisk, £45. Tel: Gerald 0865 725929

WANTED Microvitec CUB 653 monitor for QL Supercharge. Also IBM PC Wordperfect 4-1, software for Omnireader, Serial interface for Olivetti 112 electronic typewriter, also daisywheels for same. Psion Organiser II, Microwriter. Tel: 0449 47130

ONE MONTH OLD Atari 520 STM, SF 354 D/D, standard colour monitor, Prism 2000 modem, Pro 5000 joystick, software: Degas Elite, Starglider and more. Sell £700, first come first served. Tel: 01-908 6868

ATARI 1010 program recorder + software, £20. Cartridges: Football, Pacman, Defender, £5 each. Buck Rogers £8, Assembler Editor £10. Disc: Steve Davis Snooker £6, Trackball Controller £6. All boxed with instructions. Tel: Nige 051-339 3838

AMSTRAD PC 1512 DD colour. Citizen printer, stacks of software plus books etc. Cost £1,500+, offers around £1,075. Tel: 01-908 1460.

FOR SALE: Commodore 64 computer and datasette unit. Good condition. £125 o.n.o. Tel. 01-589 1240 after 5pm.

COMPSWAP

AMSTRAD CPC 6128 green screen, joystick, cassette recorder/-player. £150 worth of disc and tape software, various leads and magazines, £230 o.n.o. Tel: Cardiff (0222) 797909, ask for Alan.

27 INCH COLOUR MONITOR. Suitable for RGB input (SCART). Slightly battered case but in perfect working order. £75. Tel: 01-771 9115.

COMMODORE 64 computer, 1570 disc drive, joystick and data recorder, over 300 games. Excellent condition, £350 o.n.o. Tel: 041-248 3632 between 6–9pm.

ATARI 520ST, two 1MB drives, mono monitor, bundled software plus VIP intern, Laserbase, Easydraw, Dbase II, Address Book, K-Graph, Printmaster, Art Gallery 1–2, monitor stand, 40 discs. £1000. Tel: 01-407 5892

COMMODORE 64 1541 Speeddos 1526 printer plotter sound expander with keyboard. £300 of software, plus 100 discs for £400. No offers. Tel: Southampton 585762

AMSTRAD CPC 6128 colour, lots of software, 2 year guarantee, joystick. £320. External disc drive for all Amstrad CPCs. £75. Both excellent condition. Consider swap for 520ST. Tel: Bristol (0272) 672750

COMMODORE 128, 1571 disk drive, 2 Datasette, Mouse, Joystick, Software, Books. All boxed and in great condition, cost price £850+. Sale price £450 o.n.o. Tel: Mr Harrison at Torquay (0803) 35796 7 p.m. £1,400, sell for £1,000. Tel: 031-443 1360.

28 FULL PAGES of Spectrum games hints for £2.50. Over 180 games covered, over 600 pokes or 10 pages for £1. Write to: Grant Edwards, 19 The Maltings, Kings Langley, Herts WD4 8DL.

BBC ■, Microvitec monitor, double drives, 6502 second processor, Prestel adaptor, Canon PW1080A printer, Acorn datacorder, Watford Rom board, AMX mouse, Opus consol, Pascal, Hi-View, books, V.g.c., £600. Tel: Ross, Rayleigh 747307.

BROTHER HR5 printer. Centronics, interface with some thermal paper and ribbon. £45. Kempston interface ■ for Spectrum. Suits HR5 printer. £20. Tel: 021-778 1719 evenings.

PCW 256. Never used. £355 or exchange for CPC 128 colour. Tel: Hexham 604774 after 7pm.

ATARI 800 + Happy enhanced disc drive, tape recorder, over £400 worth of software, joystick + many utilities, 30 magazines also included. Offers over £200. Tel: 0383 622545 after 5pm.

BBC B solid disc DDFS disc drive, tape player, graphics, Xmon, Kmon, Sleuth Roms, machine code tutor, sprite definer and games on disc and tape, books, magazines, £450 o.n.o. Tel: 055671 6472.

COMMODORE 1571 disc drive, three months old, £180. Commodore 128 £180. Commodore Modem with 3 months Compunet membership £50. C64 Multiplan £20, Currah Speech £10. Tel: Crawley 514948.

AMSTRAD CPC 464 colour computer, speech synthesiser, disc drive, light pen, joysticks, disc wizard. Worth £600 plus £700 of original software on disc and tape. Sell all for £600. Tel: 0302 530818.

BBC B disc drive, colour monitor, tape player, discs, lots of software, disc doctor, books and magazines. Cost £1,200, sell for £550. Tel: 701 1806.

POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction aid. It comes complete with the largest database available – 32000 matches over 10 years. The database updates automatically as results come in.
- **PREDICTS** Not just SCOREDRAWS, but AWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolswinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture – choose as many selections as you need for your bet. The precise prediction formula can be set by the user – you can develop and test your own unique method.

Boxed, with detailed instruction booklet

- **SIMPLE DATA ENTRY** All team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below)
- **DISC/MICRODRIVE COMPATIBLE** Tapes supplied with conversion instructions.
- **PRINTER SUPPORT** Full hard copy printout of data if you have a printer

PRICE £15.00 (all inclusive)

NOW AVAILABLE

FIXGEN 86/7

AT LAST: No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish fixtures for 1986/7. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner. Yearly updates available.

POOLSWINNER with FIXGEN £16.50 (for both)

COURSEWINNER V3

THE PUNTERS COMPUTER PROGRAM

NOT just A TIPSTER PROGRAM, Coursewinner V3 can be used by experts and occasional punters alike

You can develop and test your own unique winning system by adjusting the analysis formula, or use the program in simple mode. Coursewinner V3 uses statistical analysis of major factors including past form, speed ratings, course statistics, prize money, weight, going, trainer and jockey form etc, etc. It computes most likely winners, good long odds bets, forecasts, tricasts etc. The database includes vital course statistics for all British courses. You can update the database – never goes out of date

PRICE £15.00 (all inclusive) includes Flat AND National Hunt versions.

ALL PROGRAMS AVAILABLE FOR AMSTRAD CPCs, AMSTRAD PCWs (ADD £3.00), ALL BBCs, ALL SPECTRUMS, COMMODORE 64/128, ATARI (48K+), SINCLAIR QL

Supplied on tape (simple conversion to disc) – except PCW (on 3" disc), and QL (on microdrive)

Send Cheques/POs for return of post service to:

phone 24 hrs — selec SOFTWARE — phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425

10 mins from M63 (jct 2) or M56 (jct 5)

SALE

MICROSNIPS LTD
37 Seaview Road
Wallasey
Merseyside L45 4QN
051-630 3013

All titles software stocked

PCW 8256	£439.00	Mini Office II (T)	£13.50
Scratch Pad Plus	£59.95	Music System (D)	£17.90
Popular Accounts	£89.95	AMX Mouse inc AMX Art	£67.00
Popular Payroll	£59.00	AMX Pagemaker	£47.50
Payroll/Accounts Combo	£129.00	3"/3.5" Lockable Disk Storage Box Holds 60/90	£9.95
Database	£59.00	3"/3.5" Disk Storage Box (Lockable) Holds 40	£8.95
New Word	£59.00	PC1512 SDM	£435.00
Card Index	£89.00	PC1512 SDCM	£599.00
Touch'n Go	£22.50	Intergem	£79.95
Smart Key	£39.00	Cumana 3" 2nd drive for 6128	£84.50
Brainstorm	£39.00	CF-2 3" disks 10 for	£29.00
DR Draw	£39.00	Dynex X-Data Daisywheel printer	£149.00
DR Graph	£39.00	Amstrad DMP3000 Printer	£189.00
C Basic Compiler	£39.00	DMP 2000	£159.00
Pascal MT+	£39.00	8256 Ribbons	£4.99
Supercalc II	£99.00	64K DOS by DK	£29.95
CPC6128 clr	£385.00	64K Mem. Exp. 464	£49.95
Tasword 464	£16.50	256K Silicon Disk 464 or 6128	£99.95
Tasword 464D	£20.00	PCW 256K Upgrade Kit	£39.95
Tasword 6128	£20.00	256K Mem. Exp. 464/6128	£99.95
Tas-Spell	£13.75	PCW Light inc Interface	£69.95
Taspell *	£8.75	Kempston Mouse inc Blueprint	£64.50
Tascopy * (*Disc version add £3)	£8.75	Amdrum	£34.00
Laser Basic (D)	£18.75	PCW Sound Synthesizer + Joystick Adaptor	£39.95
Laser Basic (T)	£13.50	PCW Modem	£99.95
Ultrabase	£13.50	RS232/Cent. PCW Interface	£67.50
Laser Genius	£13.50	464 Modulator/PSU	£14.95
Locksmith (D).	£14.50	664/6128 Mod/PSU	£29.95
Lightpen 6128	£18.95	**Widest range of Amstrad leads/accessories anywhere a.s.a. for lists**	
Speech Synthesizer	£29.95	Romantic Robot Multiface II	£46.00
RS232 CPC I/F	£59.95	Miraga Imager	£46.50
Centronics + Screen Dump S/Ware	£14.95		
DMP 1 Ribbon	£6.50		
DMP 2000 Ribbon	£5.95		
Mini Office II (Disc)	£17.90		

ORDER BY PHONE WITH

spectrum — VISA

ALL GAMES SOFTWARE LESS 15%

MAIL ORDER CHEQUES/P.O. to: MICROSNIPS LTD
UK add 5p in £
Overseas add 10p in £
(less tax ÷ sell price ÷ 1.15)

ALL SOFTWARE CHECKED BEFORE DESPATCH

MAROS COMPUTERS LTD, 42 Market Street, Longton, Stoke-on-Trent, Staffs. Tel: 0782 319144

★ COMMODORE; SPECTRUM; AMSTRAD; MSX & ATARI HOME & BUSINESS SOFTWARE ★ OWNERS OF **COMPUTER WORLD** RETAIL CHAIN ★

★ **30% DISCOUNTS** ★ e.g. £9.95 games will be £6.95 or £7.95 games will be £5.50 etc

★ **ALL NEW GAMES COME STRAIGHT INTO STOCK ★ ANY ENQUIRIES PLEASE PHONE 0782 319144** ★

SEND S.A.E. FOR FULL LIST, STATING COMPUTER

★ NEW RELEASES . . . TITLES NOW IN STOCK! ★

AMSTRAD	RRP	OUR PRICE
1942 (disk)	14.95	10.50
Great Escape	8.95	6.25
Yie Ar Kung-Fu	8.95	6.25
Space Harrier	8.95	6.25
Jailbreak	8.95	6.95
Top Gun	8.95	6.95
Breakthru	8.95	6.95
SPECTRUM	**RRP**	**OUR PRICE**
Scalextric	9.95	6.95
Terramorphis	7.95	5.50
Top Gun	7.95	5.50
Super Soccer	7.95	5.50
Scooby Doo	7.95	5.50
Cobra	9.95	6.95
The Great Escape	9.95	6.70
Explorer	7.95	5.50
Tomahawk	9.95	6.95
Brian Clough's Football	9.95	6.95

HARDWARE	
COMMODORE C2N RECORDER	29.95
MEGS MOUSE/CHEESE	29.95

COMMODORE	RRP	OUR PRICE
Space Harrier	9.95	6.95
Space Harrier (disk)	14.95	10.50
Tomma Hawks	9.95	6.95
Tomma Hawks (disk)	14.95	10.50
Scooby Doo	9.95	6.95
Breakthru	9.95	6.95
World Games	9.95	6.95
The Great Escape	9.95	6.25
Jailbreak	8.95	6.95
Yie Ar Kung Fu II	8.95	6.95
Super Huey II	9.95	6.95
MSX		
Avenger	9.95	6.95
ATARI		
Tomahawk	9.95	6.95
BBC		
War	8.95	6.25

★ THIS MONTH ONLY! . . . SPECIAL OFFERS! ★

COMMODORE C64	OUR PRICE
Combat Leader	1.99
Ghost Chasers	1.99
Dragon's Eyrd	1.99
Football Manager	5.95
A View to a Kill	3.50
Superman	3.50
Spitfire Ace	3.50
Geordies	3.50
Super Huey	4.50
Theatre Europe (disc)	5.95
Easy Script (disc)	9.50
Easy Spell (disc)	9.50
Superstar Ping Pong	2.99
Eureka	1.99
Intro To Basic Part 1 & 2	1.99 each
World Cup Football	1.99
War on Went (Softsac)	2.50
Crazy Comets	2.99
Treasure Hunt	2.99

SPECTRUM	OUR PRICE
World Cup Football	1.99
Cybernun	1.99
Video Pool	1.99
Eureka	1.99
Tas Word II	2.50
A View to a Kill	2.99
Superman	3.50
Knight Lore	3.99
Underworld	3.99
Tau Ceti	3.99
Dam Busters	4.99
Football Manager	5.95
Spy Hunter	3.50
Arcade Hall of Fame	5.50
Beach Head II	5.95
Aliens	6.95
Pole Position	2.99
Tapper	
Legend of Amazon Women	
Kung Fu Master	
Battle of Britain	2.50

AMSTRAD	OUR PRICE
Kung Fu Master	1.99
Battle of Britain (D)	
Daley Thompson Super Test	
Superman	2.99
Football Manager	5.95
Alien 8	1.99
ATARI	
Dnieper	1.99
Fort Apocalypse	1.99
Football Manager	5.95
Hardball	2.99
Asylum	2.99
Football Manager	6.50
Superman	2.99
MSX	
Gun Fight	1.99
All MSX cartridges	10.99

HEAD CLEANERS 50p WITH ANY PURCHASE. WHILE STOCKS LAST

PRICES INCLUDE P&P. OVERSEAS ORDERS ADD 75p POSTAGE

CHEQUES OR POSTAL ORDERS MADE PAYABLE TO MAROS COMPUTERS LTD

CREDIT CARD PHONE ORDERS WELCOME

New Releases

John Cook looks through this week's new arrivals

Amstrad CPC

Program *Ballblazer* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** Activision, Activision House, 23 Pond Street, Hampstead, London NW3 2PN.

Lucasfilm Games title with impressive split-screen 3D perspective graphics.

Program *Willow Pattern* **Type** Arcade Adventure **Price** £1.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1.

Re-release from the now defunct Super Silver range. Cute, maze-style actioned, based on the old Willow Pattern legend, as explained on Blue Peter, 15 July, 1973.

Program *Koronis Drift* **Type** Arcade/Strategy **Price** £14.99 (disc only) **Supplier** Activision, Activision House, 23 Pond Street, Hampstead, London NW3 2PN.

You want fractals? (Adopts Jewish mother voice.) You want more fractals? OK. I'll get you fractals.

Program *500cc Grand Prix* **Type** Arcade **Price** £9.99 (tape), £14.99 (disc) **Supplier** Loriciels, via Activision, Activision House, 23 Pond Street, London NW3 2PN.

For some reason, to date there isn't a decent motor spot simulation on the CPC machines – this goes some way to solving the problem. Split screen (like *Pole Position II*), 1 or 2 player, the graphics are good, even though the bikes themselves aren't too responsive. Hold hard before you spend the pennies, though – Digital Integration's *TT Racer* will be around soon. It'll be worth making a comparison before you buy.

Program *Little Computer People* **Type** Pet Simulation **Price** £14.99 (disc only) **Supplier** Activision, Activision House, 23 Pond Street, Hampstead, London NW3 2PN.

For comment see Spectrum 128/Plus 2 listing.

Program *Bactron* **Type** Arcade Adventure **Price** £9.99 (tape), £14.99 (disc) **Supplier** Loriciels, via Activision, Activision House, 23 Pond Street, London NW3 2PN.

Pick of the week

Mission Impossaball

Program *Impossaball* **Type** Arcade **Micro** Spectrum and Amstrad CPC **Price** £8.95 (tape), £14.95 (disc, CPC only) **Supplier** Hewson, 56B Milton Trading Estate, Milton, Abingdon, Oxon.

There's a vicious rumour going round that Andrew Hewson spends most of his time wandering around the streets of Abingdon wearing a sandwich board saying, "Sorry to bother you but I was just wondering, err, err, if you had any computer programs worth publishing."

Well, who knows how he does it, but *Impossaball* is another 'drag them in off the streets' job – from John Phillips. Granted that it's another bouncy-bouncy control the ball program – call it a second-cousin to the hugely under-rated *Action Reflex* if you like – but it's done very well and it's in pseudo-3D.

Within each level, you have a time limit in which you must bounce on a number of cylinders (closely guarded by fatal spikes) and get to the end of the course, avoiding the weeblies.

Revolutionary? No. Original? Not much. But for some beautifully programmed, race against time action, you need look no further.

Atari ST

Program *Lock It 1* **Type** Utility **Price** DM217.54 (plus DM10 p&p) **Supplier** Tommy Software, Mainzer Landstrasse 147, D-6000, Frankfurt/M 1, West Germany.

Professional copy protection for your ST programs. The company are presently looking for distributors in the UK, but it's mail order only right now.

Program *Crypt It 1* **Type** Utility **Price** DM217.54 (plus DM10 p&p) **Supplier** Tommy Software, Mainzer Landstrasse 147, D-6000, Frankfurt/M 1, West Germany.

Encryption for your more sensitive data, for storing on disc or sending via modem.

Program *Silicon Dreams* **Type** Adventure **Price** £19.95 **Supplier** Rainbird Software, 74 New Oxford Street, London WC1.

The new, improved versions of three Level 9 'classic' adventures, *Snowball*, *Return to Eden*, and *The Worm in Paradise*.

Nice work in terms of vocabulary, parser and save features – but don't expect Pawn-like graphics.

Program *The Wanderer* **Type** Arcade **Price** £24.95 **Supplier** Pyramide, via Reo Promotions, 28 Waverley Grove, London N3 3PX.

3D *Elite*-style graphics (red and blue plotting on screen, and you wear the funny glasses), which falls down a little on gameplay.

Program *Eazy Calc* **Type** Utility **Price** £49.95 **Supplier** Robtek, Unit 4, Isleworth Business Complex, St Johns Road, Isleworth, Middx TW7 6NL.

GEM-based spreadsheet for your very own ST.

CBM 64

Program *Murder Off Miami* **Type** Adventure **Price** £7.95 **Supplier** CRL, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD.

Murder mystery based on a Denis Wheatley novel, written by Delta 4, brought to your computer courtesy of CRL. Comes complete with photos of the dramatis personae (can you spot the Irene Handle look-alike?) and a plan of where the dirty deed took place. As a three-parter, it should keep you going for a while, Inspector.

Program *Willow Pattern* **Type** Arcade Adventure **Price** £1.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1.

See Amstrad CPC listing section for comment.

Program *Conquest* **Type** Arcade Adventure **Price** £2.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

Slightly reminiscent of *Avalon*, maybe, but still jolly good fun from the keyboard of Derek Brewster.

Program *The BIG Deal — Floyd The Droid II* **Price** £9.95 (tape), £14.95 (disc) **Supplier** Radarsoft, via Anglasoft, Long Acre, London WC2.

Remember *Floyd The Droid*, where you have to keep the sewers clear with your electronic chum? Now Floyd has been modified to work in a fast food joint – let's hope he washed his stepper motors first.

Looks good – and there's more to the game than first meets the eye.

Spectrum

Program *Willow Pattern* **Type** Arcade Adventure **Price** £1.99 **Supplier** Firebird Silver, 74 New Oxford Street, London WC1.

For comment, see under Amstrad CPC listing.

Program *Samurai* **Type** Strategy **Price** £7.95 **Supplier** CRL, CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD.

Strategy in the Land of the Rising Sun from CRL. Icon driven, scrolling map, it looks like a winner.

Program *Ninja* **Type** Arcade **Price** £1.99 **Supplier** Mastertronic, 8–10 Paul Street, London EC2.

Spectrum 128/Plus 2

Program *Koronis Rift* **Type** Arcade/Strategy **Price** £9.99 **Supplier** Activision, Activision House, 23 Pond Street, London NW3 2PN.

Program *Little Computer People* **Type** Pet Simulation **Price** £9.99 **Supplier** Activision, Activision House, 23 Pond Street, London NW3 2PN.

FACULTY ENTERPRISES LTD

SPECTRUM		C64		AMSTRAD	
GAUNTLET	£8.99	COBRA	£7.05	ALIENS	£7.99
COBRA	£7.90	SUPERBOWL	£7.05	SPITFIRE 40	£7.99
SUPERSOCCER	£7.90	SAM III	£7.95	A.C.E	£7.99
N.E. STORY 128K	£6.90	HARDBALL	£7.95	(DISK)	£10.95
BATTLE OF BRITAIN	£9.90	A.C.E	£8.95	FOOTBALLER OF THE YEAR	£7.95
DT'S SUPERTEST 128K	£6.90	SKYRUNNER	£7.95	GAUNTLET	£8.99
GHOSTBUSTERS	£4.99	GHOSTBUSTERS	£4.99	RED ARROWS (DISK)	£9.99
SPITFIRE 40	£8.95	POLE POSITION	£5.99	TAPPER	£7.95
A.C.E	£8.95	LEADERBOARD	£5.99	SPACE HARRIER	£7.99
MASTERS OF UNIVERSE	£8.50	143 ONE YEAR A	£7.90	JAILBREAK	£7.99
TERRACRESTA	£7.50	DYNAMITE DAN	£7.95	TOP GUN	£7.99
GREAT ESCAPE	£8.50	RED HAWK (DISK)	£11.99	PALITRON	£8.90
SPACE HARRIER	£7.50	STARION (DISK)	£9.99	ROCK 'N' WRESTLE	£7.99
SUPERCYCLE SPEC 128K	£7.50	SCOOBY DOO	£7.05	BRIDGE 3 (DISK)	£9.99
PLUS 2 WITH 6 GAMES	£159.95	FOOTBALL MANAGER	£4.89	FOOTBALL MAN	£4.89
				HEAVY ON MAGIK (DISK)	£9.99

SEND CHEQUES AND PO'S TO: FACULTY ENTERPRISES LTD 7A SHERWOOD CRESCENT MARKET DRAYTON, SHROPSHIRE. TEL: 0630 57465

COME AND SEE OUR SHOP!

PROGRAMMERS WANTED DUE TO EXPANSION IN 1987

A TOP UK SOFTWARE HOUSE IS LOOKING FOR PROGRAMMERS TO WORK ON C64, SPECTRUM , AMSTRAD, ATARI ST SOFTWARE PROJECTS

Write to:

Leigh Richards
C.S.D. Unit B11
Armstrong Summit Centre
Southwood, Farnborough
Hants GU14 0NP

Tel: 0252 543303

Preaching to the converted

I was fascinated to read the article in Ziggurat, 8–14 January 1987, by K P Dutton saying how he felt that much of the excitement generated by the launch of such computers as the Atari ST, the Amiga and the cheap IBM PC Clones is a product of media hype, and that the average user simply does not *need* the amount of Ram, processing power, or icon-driven mouse-infested front end which many of the new machines boast.

Up until around 10 months ago, I would have totally agreed with Mr Dutton. Then, I had a system similar to his own, a BBC model B with discs, printer, colour monitor, and a few other peripherals such as a modem and a teletext adaptor. I had very similar uses for the machine.

Using Rom software for word-processing, I was quite convinced that 32K was enough. And anyway, when I ran out of Ram, I could always shovel what I had written onto disc, and carry on afresh with a blank 32K.

When the database ran out of Ram, things were a little more serious, but cutting the data into two separate files meant that the Beeb coped.

It was also annoying when adventures were truncated because of the Beeb's meagre memory . . . and so I joined the band of 'text-only-is-better' adventure players, mainly because BBC adventures couldn't fit graphics in.

Then I finally decided that I would jump on the bandwagon, and bought an Atari 520ST, after seeing one demonstrated at my local computer club. Beforehand, I went through a similar dilemma to Mr Dutton, telling myself that I didn't really need the new machine. This was true, I didn't. But I could have used a similar argument about upgrading from a type-writer to a word-processor.

My ST doesn't do anything that my Beeb couldn't do. Indeed, I still have my BBC system, and I use it for communications, because it is quite simply the best computer for comms around. What my ST does do is make word-processing, or handling a database so much *easier*. And that means it's *faster* too. As for games, anyone who has played *The Pawn* or *A Mind Forever Voyaging* knows what 16-bit graphics power and extra Ram can do.

As to the mouse-infested, icon-driven front end, I agree that the Beeb style O/S is quite adequate. But I don't think that many people would disagree that housekeeping on micros which only use command line Interfaces is a chore, and using an icon system, perhaps with a Ram disc, makes things quicker, easier, and therefore increases the likelihood that the housekeeping gets done!

And what about the things which I didn't do on my Beeb because it was inconvenient? After I'd had my ST for a month or so, someone showed me a drawing program. "Huh!", I said "What do I want with a drawing program?!". But it was cheap, quick and easy to use, and it produced professional results.

I bought a copy to play around with, and before you could say "mouse droppings", found myself including black and white illustrations with my articles which were of a good enough quality (printed on a matrix printer) to be photographed and printed in magazines.

I would never have considered doing that on an 8-bit machine. But with the Wimp environment, it was so easy to do that it was no more than a natural progression. Some AMX mouse owners will be screaming for my blood by now, but I still maintain that until a mouse is used to control *all* the machine's facilities, including O/S commands, etc, using one as an addition is uncomfortable, and I know of many AMX users who agree.

So what should Mr Dutton do? Well, I would suggest that he should borrow an ST, and use it for a month or two. If after that time, he still feels that his Beeb can do all the ST can, I apologize for wasting his time. Somehow, though, I doubt if that would be the case.

David Machin

NEXT WEEK

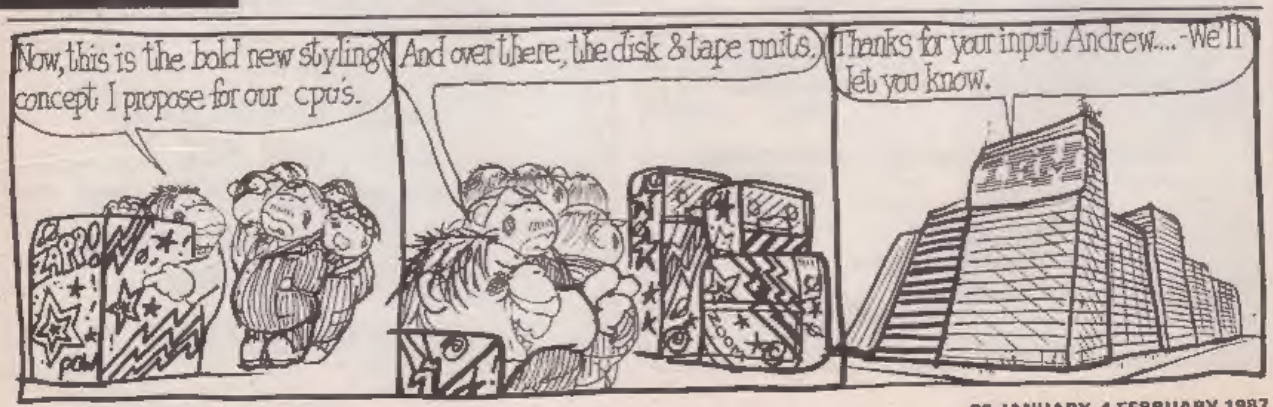
Beginners Guide to Computing part four

The final part of our series for newcomers to computing looks at the industry standard CP/M operating system, an additional feature of many Z80-based micros today (held over from this week) and alternative computer languages. How do languages like Pascal, Logo and Forth score over Basic, and what do they do?

Having got started with your micro, where do you hope to end up? We peer into our crystal balls to look at some of the newest technology which will becoming available to the micro owner in the years to come.

Micro Repairs

Sending your micro away for repairs is an anxious business. We visit one repair company to find out exactly how they go about fixing damaged computers.



Butch
Hard Guy
By Future Concepts
Butch makes Ram★★ look like Mary Poppins
Who Cares Who Wins!
SPECTRUM 48K/128K
Price £7·95
LIMITED OFFER FREE Butch Badge inside each copy
Advance
ADVANCE • SOFTWARE • PROMOTIONS • LIMITED
17 • STAPLE TYE • HARLOW • ESSEX • CM18 7LX • TEL • (0279) 412441

21st CENTURY WARRIOR:
Apache GUNSHIP

The Apache ... Fierce and elusive, like its warrior namesake ... Capable of defeating enemy tanks, infantry, and hostile aircraft on the modern electronic battlefield.

Gunship's revolutionary 3-D graphics enable you, the pilot, to fly into the world's hottest trouble spots ... You'll use an unbelievable array of high tech information and weapon systems, including lasers, video cameras, night viewers, radar warnings, jammers, computers, missiles, rockets, flares and a 30mm cannon! Successful missions will be rewarded with medals and rank promotions.

Experience the danger and excitement of attack helicopter action ... your latest adventure in the ever-growing line of MicroProse Simulation Software.

See your software dealer today and become a part of the GUNSHIP adventure! Challenge the enemy, the sky, and YOURSELF with this extraordinary simulation.

GUNSHIP for Commodore 64/128. Cassette £14.95. Disk £19.95

MICROPROSE
SIMULATION • SOFTWARE

Please send _____ copy/ies of GUNSHIP CBM 64/128 Cassette _____ CBM 64/128 Disk _____ Details of the full Microprose range _____

Name (Block Caps) _____ Address _____

_____ Postcode _____

Which magazine have you cut this coupon from? _____

Please debit my Access Visa Card No. _____ Expiry Date _____

Cheques payable to MICROPROSE SOFTWARE LIMITED, 2 Market Place, Tetbury, Glos GL8 8DA I enclose 55p postage and packing.